

amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



VOL. 46, No. 8

AUGUST 1978

CONTENTS

TECHNICAL

Afterthoughts	4
ATV Pictures from the Sky	42
Commercial Kinks	42
Delayed Braking Action for Rotators	27
Equipment Review: The Astro 200 Transceiver	16
Improving the Ailiss 210X Transceiver	18
Modifying CB Transceivers to 10 Metres for \$24	23
Novice Notes	35
Technical Correspondence	40
Video Gunnplexer System	28

GENERAL

Australian VHF, UHF, SHF Records	4
Cape York SSTV Dx-Pedition	34

Close Federal Look at CB	17
Midland Zone Convention	32
Programmes Specifically for Dxers and Keen SWLs	47
The "Solo" Voyage	6
VK/ZL/Oceania Dx Contest Rules — 1978	48

DEPARTMENTS

Amateur Satellites	51
Around the Trade	41
Awards Column	57
Contests	48
Divisional Notes	41
Hamads	57
IARU News	57
Intruder Watch	49
Ionospheric Predictions	47
LARA	41
Letters to the Editor	55

Magazine Index	57
OSP	3, 4, 12, 26, 47, 57
Repeaters	43
Silent Keys	58
VHF-UHF — an expanding world	50
WIANEWS	4
WICEN	49
20 Years Ago	43

ADVERTISERS' INDEX

58

COVER PHOTO

The yacht "Solo" in pack ice near the Balleny Islands. The radar scanner on the mizzen mast, and the long aerial joining the trizic stay to the mainmast can be seen.

See article The "Solo" Voyage on page 5.

Registered for posting as a Publication — Category "B".



RADIO SUPPLIERS

323 ELIZABETH STREET, MELBOURNE, VIC., 3000

Phones: 67-7329, 67-4286

Our Disposals Store at 104 HIGHETT ST., RICHMOND (Phone 42-8136) is open Mondays to Fridays, 9.00 a.m. to 5.00 p.m., and on Saturdays to midday.

WALKIE TALKIE

SPECIFICATIONS:

TRANSMITTER: — Frequency: in 27 MC citizen band, 27240. Final input power: 100 mW (max.).
Communication Mod.: (AM) balanced mod. Oscillator: Crystal controlled. Antenna: Vertical type, telescopic antenna, 37" fully extended.
RECEIVER: Receiving System: Crystal controlled superheterodyne system. Sensitivity: S/N 10 dB or better at 10 μ V 5 mW output. Selectivity: Thermistor: D-325. Power Supply: 600p 5W. Dimensions: H — 17.8 cm. W — 6.5 cm. D — 4.4 cm. Weight: 500g.
PMG approved.

PRICE \$58.90 PAIR
Postage \$2.40

POWER-SWR METER

This is an in-line and SWR meter for ham radio and CB radio. This power meter indicates the output power of your transmitter and SWR meter reads the ratio of travelling power to your antenna and reflected back from antenna. Compact and inclined front design meet any radio operation desk.
SPECIFICATIONS: — Range measured: Power meter 0-10, 100 watts, 2 ranges VSWR 1:1 — 1:3. Freq. response: 3-150 MHz. Impedance: 50 ohm. Dimensions: 70 x 98 x 100 mm. Weight: 800g.

PRICE \$38.90
Postage \$2.40

PL-259 Plug W/Reducer \$1.50
PL-259 Plug W/O Reducer \$1.40 (Adaptors 50c)
SO-239 Chassis Socket \$1.50
Right-Angle Joiner \$2.75
"T" Connection \$3.50
PL-259 to R.C.A. Adaptor \$2.75
Coax Joiner, female to female, male to male \$2.75

BNC Plugs \$1.95
BNC Sockets \$1.75
Belling Lee Plugs 75c
Belling Lee Sockets 50c
Belling Lee Joiner 85c
150 Metre Roll Hook-Up Wire \$4.50
All above items plus postage

YAESU FRG-7

THE RADIO FOR WORLD-WIDE LISTENING
AT ITS BEST — 0.5-29.9 MHz COVERAGE
SYNTHESIZED COMMUNICATION RECEIVER



The model FRG-7 is a precision built high performance communication receiver designed to cover the band from 0.5-29.9 MHz. Its state of the art technology offers an unprecedented level of versatility. The Wadley Loop System (dip cancellation circuit) coupled with a triple conversion super heterodyne system guarantees an extremely high sensitivity and excellent stability. It provides complete satisfaction to amateurs as well as BCLs with superb performance and many features such as RF attenuator, selectable tone, and automatic noise suppression circuit.

\$348.00

BULK STORE DISPOSALS

AT 104 HIGHETT STREET
RICHMOND, 3121
Phone (03) 42-8136

100 FT. ROLL BELL WIRE — 16 Gauge
\$3.00 per Roll

SINGLE CORE OUTSIDE SHIELDED
CABLE 77.0076, 100 yard rolls
\$15.00 per Roll

OMRON RELAY MK 3 DC 35 volts, 3
amp rating, 3 pole changeover. To
operate on 220 volts DC or 110 volts DC
Series Resistor 5.83 watts
\$5.00 each

NEW MAGNAVOX 53TS SPEAKERS

5" x 3" 8ohm, ideal for small extension
speaker for communications equipment.
\$1.95 each plus P&P

CRYSTALS FOR CITIZENS RADIO

Channel No.	Freq. MHz	Channel No.	Freq. MHz
1	27.015	11	27.135
2	27.025	12	27.155
3	27.035	13	27.165
4	27.055	14	27.175
5	27.065	15	27.185
6	27.085	16	27.195
7	27.095	17	27.205
8	27.105	18	27.225
9	27.115	19	27.240
10	27.125	20	27.240

\$7.50 PAIR — Postage 25c

CRYSTALS MADE TO ORDER

\$9.50 — Postage 25c

HANSEN SWR6

POWER METER & FIELD STRENGTH INDICATOR

Handy for checking transmitter operation. Uses bridge method for SWR measurements. Simple and accurate operation. CM method employed for RF power measurement.

PRICE \$22.00
Postage \$1.80

100 METRE ROLLS SPEAKER WIRE

\$11.50 per roll — Post free

2 5TN INTERCOM and battery 5V \$12.50
3 5TN INTERCOM and battery 9V \$18.00 ea.
4 5TN INTERCOM and battery 9V \$26.50 ea.
Complete with 60 ft. wire, ideal for garage, baby room, etc. — Postage \$1.50

ARLEC PLUG-PACK

PLUG-IN POWER SUPPLY

Plugs directly into 240 volt mains supply power sockets and provides 12 volt 1 amp smoothed DC for powering low voltage and battery operated equipment — Transceivers, cassette recorders, cartridge players, burglar alarms, electric models and toys, car radios, etc. 12 Volt 1 amp SEC approved, double insulated, overload protected.

PRICE \$15.90 Postage \$1.80

We also have a large range of **ELECTRONIC DISPOSALS EQUIPMENT**, including TRANSFORMERS, CABLE, TEST EQUIPMENT, TRANSMITTERS, METERS, etc.

You are invited to call in and inspect. **NO PARKING PROBLEMS** at 104 HIGHETT STREET RICHMOND. Phone 42 8136.

WE STOCK CB GEAR AS WELL AT VERY COMPETITIVE PRICES, INCLUDING ANTENNAS AND ACCESSORIES.

KEMTRONIC SSB1000

SSB/AM TRANSCEIVER

27 MHz CITIZENS RADIO SERVICE

The SSB 1000 embodies the latest in high frequency transceiver design techniques. It is designed to operate on either AM, USB or LSB. It is capable of transmitting and receiving on a total of 54 channels (18 AM, 18 USB, 18 LSB). The 18 channels are in accordance with the P&T Dept conditions for operation of the Citizens Radio Service.

NETT PRICE \$220.00

Registered Post — \$4.00

TRADIPER Model TE-15

The Model TE-15 Transistorized Grid Dip Meter is a very accurate instrument operating from a 9 volt battery power supply. Six plug-in coils are supplied with each unit, covering the frequency range of 360 kHz to 240 MHz. The Model TE-15 can be used for a number of useful purposes. With the most common use as a Grid Dip Meter, can also be employed as a relative field strength meter. It is ruggedly constructed and very light in weight. Because of transistorised circuit employed there is no need for an AC power supply as used in many other models. The Model TE-15 will certainly prove invaluable to radio amateurs.

PRICE \$65.00

Postage \$2.40

ARLEC PLUG-IN BATTERY CHARGER

Delivers 1 amp output at 12 volts. Designed to run continuously over long periods, will maintain a fully charged battery in peak condition or recharge flat battery. Double insulated for max. safety, electrically protected by fully automatic circuit breaker. No mains leads to get tangled, plugs directly into power socket. Comes with 3 metre battery leads fitted with clips. For use on 240V, 50 Hz supply.

PRICE \$14.90

Postage \$1.80

SPECIAL

8" x 6" SPEAKERS — brand new in cartons — 4 ohm impedance — ideal for car cassettes, radios, etc.

PRICE \$4.00 EACH — Postage \$1.00
10 FOR \$3.00 — BULK BUY

MAIL ORDERS WELCOMED. Please allow pack and post on items listed on this page. If further information required send a stamped SAE for immediate reply from the above address. Larger items can be sent F.O.B. Due to circumstances beyond our control, prices quoted in this advertisement are subject to alteration without notice.

amateur radio

Published monthly as its official journal by the Wireless Institute of Australia, founded 1919.

AUGUST 1978

VOL. 48, No. 8

PRICE: 90 CENTS

(Sent free and post paid to all members)

Registered Office:
2/517 Toorak Road,
Toorak, Victoria, 3142.

EDITOR:

BRUCE BATHOLDS* VK3UV

ASSISTANT EDITORS:

RON COOK* VK3AFW
GIL SONES* VK3AJU

TECHNICAL EDITORS:

BILL RICE* VK3ABP
KEN PALLISER VK3GJ

CONTRIBUTING EDITORS:

BOB ARNOLD VK3ZBB
BRIAN AUSTIN VK6CA
ROD CHAMPNESS VK3UQ
SYD CLARK* VK3ASO
RON FISHER* VK3OM
DAVID HULL VK3ZDH
ERIC JAMIESON VK5LP
KEN JEWELL VK3AKK
PETER MILL VK3ZPP
KEVIN PHILLIPS VK3AUO
LEN POYNTER* VK3ZGP

DRAFTING:

DISTRICTS DRAFTING SERVICE
KEN GILLESPIE* VK3GK

PHOTOGRAPHER:

REG. GUDGE —

BUSINESS MANAGER:

PETER DODD VK3CIF

ADVERTISING:

PETER SIMMONS

*Member of Publications Committee

Enquiries and material to:
The Editor,
PO Box 2811W, GPO Melb., 3001

Copy is required by the first of each month. Acknowledgment may not be made unless specially requested. All important items should be sent by certified mail. The editor reserves the right to edit all material, including Letters to the Editor and Remarks, and reserves the right to refuse acceptance of any material, without specifying a reason. Advertising: Material should be sent direct to P.O. Box 150, Toorak, Vic., 3142, by the 25th of the second month preceding publication. Phone: (03) 24 8952. — Remarks should be sent direct to P.O. Box 150, Toorak, Vic., 3142, by the 3rd of the month preceding publication.

Trade Practices Act: It is impossible for us to ensure that advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that the provisions of the Act are complied with strictly. Readers are reminded that, when buying, obtaining or receiving goods from overseas including goods listed in advertisements by overseas organisations in this journal, Customs import duties and Sales Tax may be levied on the goods at the time of importation. These amounts, if any, are payable by the purchaser unless the terms of sale state otherwise and the seller has made specific provision to this effect in his quotation to the buyer or unless other prior arrangements are in force between the buyer and the seller.

Printers: EQUITY PRESS PTY. LTD.
50-52 Islington Street, Collingwood, 3068
Tel: 41-5054, 41-5055

QSP —

NOVICE PRIVILEGES

During my recent visit to New Zealand discussion got around to the New Zealand novice class of licence. The comment was made to me that there had been remarkably few candidates presenting and that interest at this stage was at a remarkably low level. This surprised me because of the popularity of the novice class licence in Australia, however, further questioning elucidated the fact that the New Zealanders have quite restricted privileges, including a non-renewable tenure.

The Australian novice amateur certainly has many more privileges than his counterpart in many other countries, including the USA. As you know the Federal Council at this year's Federal Convention considered in depth many matters concerning novice licensing. Already since the introduction of the novice licence the WIA, with good reason, has obtained some extra privileges: the move to 28 MHz with a 500 kHz wide band and also permission to use VFOs. Currently the Institute is negotiating for the extension of the novice 90 metre segment. Nevertheless, the Federal Council was unanimous in agreeing that the novice grade licence should still be considered to be a stepping stone to the higher grades of licence.

They felt that as there are already quite liberal privileges for novices further extensions would tend to reduce the value of upgrading to an insignificant level. It was also felt that the examination standard is becoming more consistently at a level considered as suitable for novice entry into amateur ranks.

Those of us who in the past had no novice pathway into amateur ranks must now recognise the help that this grade has been in attracting recruits into the amateur service in the face of intense competition from many and varied types of recreational activity.

DAVID WARDLAW VK3ADW, Federal President.

WIRELESS INSTITUTE OF AUSTRALIA

Federal President: Dr. D. A. Wardlaw VK3ADW

Federal Council:

VK1 Brig. R. K. Roseblade VK1QJ

VK2 Mr. T. I. Mills VK3ZTM

VK3 Mr. J. Payne VK3AED

VK4 Mr. H. F. Wilson VK4NP

VK5 Mr. I. J. Hunt VK5GX

VK6 Mr. N. R. Penfold VK6NE

VK7 Mr. P. D. Frith VK7PF

Staff: Mr. P. B. Dodd VK3CIF, Secretary.

Part-time: Col. C. W. Perry, Mrs. J. M. Seddon and

Mr. P. Simmons (AR advertising).

Executive Office: P.O. Box 150, Toorak, Vic., 3142.

2/517 Toorak Rd., Toorak, Ph. (03) 24 9852.

Divisional Information (all broadcasts are on Sundays unless otherwise stated):

ACT:

President — Mr. E. W. Howell VK1YH

Secretary — Mr. Ted Radcliffe VK1TR

Broadcasts — 3570 kHz & 148.5 MHz: 10.00Z.

NSW:

President — Mr. D. S. Thompson VK2B0T

Secretary — Mr. T. I. Mills VK3ZTM

Broadcasts — 1825, 3595, 7140 kHz, 28.47, 52.1, 52.535, 144.1, Ch. 8 and other relay stations: 01.00Z. (Also Sunday evenings 09.30Z and Hunter Branch, Mondays 09.30Z on 3570 kHz and ch. 3 and 6).

VIC:

President — Mr. E. J. Bugge VK3Z2N

Secretary — Mr. J. A. Adcock VK3ACA

Broadcasts — 1825, 3595, 7135 kHz — also on 6m, 2m SSB and 2m Ch. 2 repeater: 09.30Z.

QLD:

President — Mr. A. J. Aarse VK4QA

Secretary — Mr. W. L. Gielis VK4ADG

Broadcasts — 1825, 3595, 7140, 14342, 21175, 29400, kHz; 2m (Ch. 42, 48): 09.00 EST.

SA:

President — Mr. C. J. Hunt VK5NH

Secretary — Mr. C. M. Pearson VK5PE

Broadcasts — 1820, 3550, 7095, 14175 kHz; 28.5 and 53.1 MHz; 2m (Ch. 8): 09.00 S.A.T.

WA:

President — Mr. L. A. Bell VK6AN

Secretary — Mr. P. Savagis VK6NCP

Broadcasts — 3900, 7900, 14100, 14175 kHz, 52.69 and 2m (Ch. 2): 01.30Z.

TAS:

President — Mr. I. Nicholls VK7ZZ

Secretary — Mr. M. Hennessey VK7MC

Broadcasts — 3570, 7130 kHz: 09.30 EST.

NT:

Secretary — Mr. Henry Andersson VK8HA

Broadcasts — Relay of VK5WI on 3.65 MHz and on 148.5 MHz at 2330Z. Slow more transmission by VK8HA on 3.65 MHz at 1000Z almost every day.

Postal Information:

VK1 — P.O. Box 46, Canberra, 2600.

VK2 — 14 Atchison St., Crown Nest, 2085 (Ph. (02)

43 5795 Tues & Thurs (10.00-14.00h).

VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03)

41 3555 Sat 10.00-12.00h).

VK4 — G.P.O. Box 538, Brisbane, 4001.

VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at

West Thebarton Rd., Thebarton (Ph. (08)

294 7442).

VK6 — G.P.O. Box N1002, Perth, 6001.

VK7 — P.O. Box 1210, Launceston, 7252.

VK8 — (Incl. with VK5), Darwin AR Club, P.O. Box

37317, Winnellie, N.T., 5789.

Slow more transmissions — most week-day evenings

about 09.30Z onwards around 3550 kHz.

VK QSL BUREAU

The following is the official list of VK QSL Bureaux, all are inwards and outwards unless otherwise stated.

VK1 — QSL Officer, G.P.O. Box 1173, Canberra, A.C.T. 2601.

VK2 — QSL Bureau, C/- Hunter Branch, P.O. Taralba, N.S.W. 2284.

VK3 — Inwards QSL Bureau, Mr. E. Trebilcock, 340 Gillies Street, Thornbury, Vic. 3071.

VK3 — Outwards QSL Bureau, Mr. R. R. Prowse, 83 Brewer Road, Benilgaigh, Vic. 3204.

VK4 — QSL Officer, G.P.O. Box 538, Brisbane, Qld., 4001.

VK5 — QSL Bureau, Mr. Geo. Luxon VK5RL, 27 Belair Road, Torrens Park, S.A. 5062.

VK6 — QSL Bureau, Mr. R. M. Runkle VK6RU, G.P.O. Box F318, Perth, W.A. 6001.

VK7 — QSL Bureau, G.P.O. Box 3717, Hobart, Tas. 7001.

VK8 — QSL Bureau, C/- VK8HA, P.O. Box 37317, Winnellie, N.T., 5789.

VK9, 0 — Federal QSL Bureau, 23 Lendale Street, Box Hill, Vic. 3128.

WI NEWS

NOVICE EXAMINATION

The Federal Education Co-ordinator, Graeme Scott, VK3ZR, arranged a special meeting early in June of educational experts, mainly from Victoria and New South Wales. A bank of nearly 500 Novice examination questions and answers was prepared, the bulk of which were transcribed on to systems cards for ultimate presentation to the Department. In addition arrangements were set in hand relating to typical question papers for Trial Novice exams and similar purposes.

TV CHANNEL 5A

As already reported, the Executive was heavily engaged with the problems of TV Channel 5A. The use of this channel, unique to Australia and adjacent to the 2m band, continues to be opposed.

EXECUTIVE MEMBERS

The departure overseas of Keith Rogot, now VR4AV as well as VK3YQ, results in a vacancy for Honorary Treasurer. Certain office re-organisation appeared necessary to relieve the future Treasurer of much of the routine work so well carried out in the past by Keith for whom a most grateful vote of thanks was recorded. Any qualified volunteers to help out in this field would be greatly welcomed.

AFTERTHOUGHTS

AN ULTRA LOW-NOISE FET VIDICON AMPLIFIER

(June, 1978)

The following information was omitted from Figure 1:

1. The bypass capacitor at the target bias input should be 100 nF, 100 VV.
2. The collector of Q6 should be marked point "A".
3. The direction of clockwise rotation of potentiometers are as follows: AMP BIAS: right, LF COMP: up, SET UP: down, SYNC LEVEL: up.

QSP

GIPPSLAND GATE RADIO CLUB

Oakwood Park Scout Hall, Heyington Crescent, Noble Park (opposite Titcher Road).

Postal: P.O. Box 98, Dandenong 3175.

Meetings: Second and fourth Friday of each month at 8.45 p.m.

President: John Watkins VK3EW.

Phone: 782 2422.

Club Callsign: VK3BJA.

Educational Classes for MOCOP: conducted Monday nights at above address. For details contact Lionel Gurling VK3NM. Phone 88 3710.

CLUB NETS

Sundays: 12 metre net 28.4 MHz, 12 noon EST.
2 metre net ch. 50 (146.5) 7.30 p.m. EST.
Thursdays: 80 metre net, 3.580 MHz, 8 p.m. EST.

USA — BAN ON CERTAIN LINEARS

The FCC has, in Dockets 2116-7, voted to prohibit the manufacture, import or marketing of external RF power amplifiers capable of operation on any

AUSTRALIAN VHF, UHF, SHF RECORDS

AS AT 1 JUNE 1978

NEW SOUTH WALES

50/52 MHz	VK3ADE to VETAOQ	8/4/59	km	miles
144 MHz	VK3ATO/2 to ZL2HP	2/1/60	2,344	1,457
432 MHz	VK42T/2 to VK4KE/4	12/7/69	352	219
576 MHz	VK2HO to VK2ZAH/2	12/3/61	107	66
1,296 MHz	AX42T/2 to AX4KO/4	12/4/70	402	250
2,300 MHz	VK3ZAC/2 to VK2BND/2	19/5/73	159.9	98.4
3,360 MHz	VK2AMC/2 to VK2BH/2	16/1/77	114.1	70.9
8,550 MHz	VK2AMC/2 to VK2BS/2ZND/2	12/4/75	114.1	70.9
10,000 MHz	VK2AMC/2 to VK2BS/2ZND/2	12/4/75	114.1	70.9

VICTORIA

50/52 MHz	VK3ALZ to XE1FU	1/5/59	13,545	8,414
144 MHz	VK3ZNC to ZL2HP	13/12/65	2,592	1,673
432 MHz	+ VK3ZQV to VK3Y	22/2/70	2,893	1,812
576 MHz	VK3AO7/3 to VK3ZKB/3	11/4/71	237	147.5
1,296 MHz	VK3AKC to VK7ZAH	17/2/71	439	273
2,300 MHz	VK3AT/2 to VK3ZHU/3	6/12/74	218	136
3,300 MHz	VK3ZG1/3ZGK/3 to VK3ZDQ/3	14/12/63	101.4	63.0
5,650 MHz and above	No claims			

QUEENSLAND

50/52 MHz	VK4ZAZ to K6IRG	16/3/58	8,536	5,305
144 MHz	VK4RO to VK3AMK	21/12/74	2,079	1,292
432 MHz	VK4KE/4 to VK4ZT/2	12/7/69	352	219
576 MHz	No claim			
1,296 MHz	AX4NO/4 to AX4ZT/2	12/4/70	402	250
2,300 MHz and above	No claims			

SOUTH AUSTRALIA

50/52 MHz	VK5KL to W7ACG/KH6	26/8/47	8,526	5,301
144 MHz	VK5BC to ZL2HP	23/12/65	2,592	1,673
432 MHz	AX5ZKR to AX7ZRO/7	16/3/70	376	234
576 MHz	VK5ZJL/3 to VK5OZ/5	28/12/69	714	443
1,296 MHz	+ VK5QR to VK5W	25/1/77	1,888	1,171
2,300 MHz	+ VK5QR to VK5W	17/2/77	1,888	1,171
3,300 MHz	No claim			
5,650 MHz	No claim			
10,000 MHz	VK5CU/5 to VHSZMW/5	30/12/71	96.7	59.5

WESTERN AUSTRALIA

50/52 MHz	VK6BE to JA8BP	30/10/58	8,533	5,490
144 MHz	VK6KJ to VK3AO7	1/2/70	2,441	1,517
432 MHz	+ VK6KY to VK3ZQV	22/2/70	2,899	1,812
576 MHz	VK6ZDS to VK6L/6	18/12/63	163	101
1,296 MHz	+ VK6W to VK6Q	25/1/77	1,888	1,171
2,300 MHz	+ VK6W to VK6Q	17/2/77	1,888	1,171
3,300 MHz and above	No claims			

TASMANIA

50/52 MHz	VK7LZ to JA8HL	3/12/59	8,788	5,462
144 MHz	VK7ZAH to VK4ZAZ	1/1/67	1,976	1,187
432 MHz	AX7ZRO/7 to AX5ZKR	18/3/70	719	442
576 MHz	No claim			
1,296 MHz	VK7ZAH to VK3AKC	17/2/71	439	273
2,300 MHz and above	No claims			

Australian records are in bold type.

AUSTRALIAN EME RECORDS

144 MHz	VK3ATH to K2MWA/2	28/11/68	16,761	10,417
432 MHz	+ VK3AMW to G3L7F	30/3/74	16,955	10,536
1,296 MHz	VK3AKC to W2RFA	8/10/73	16,713	10,385

AUSTRALIAN ATV RECORDS

432 MHz	VK7EM/T to VK3ZPA/T	13/12/72	413	256.6
---------	---------------------	----------	-----	-------

+ Also world record.

Before a contact can be listed as an Australian (or world) record, a claim must be made in writing to the Federal Office of the WIA. All claims are processed by the VHF Advisory Committee in conjunction with an independent investigation.

frequency from 24 to 35 MHz. It also voted to require, for three years, type acceptance of all RF amplifiers capable of operation below 144 MHz manufactured, marketed or imported for use in the Amateur Radio Service.—Worldradio May 1978.

The FCC comment was that half of all complaints of CB-related interference resulted from the illegal use of external amplifiers and that many CBers complained they were themselves blocked by others using such amplifiers.

NOVICE SYLLABUS

Copies of the recent P. and T. approved Novice

syllabus and study guide are available free to class leaders and instructors.

Please forward details of your involvement to the WIA Federal Office, P.O. Box 150, Toorak, Vic. 3142.

JOTA 1978

Have you made arrangements to help out for the 21st JOTA beginning about 06.01h local time on 21-10-1978 and ending 48 hours later? The official World Scout frequencies are 3740, 7090, 14250, 21360, 28990 kHz phone and 3590, 7030, 14070, 21140 and 28190 kHz CW. Listen before calling "CO Jamboree".



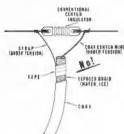
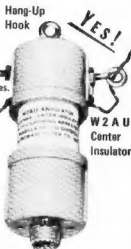
RADIO AMATEUR BAND ANTENNA PRODUCTS

SCALAR

W2AU "ANSULATOR"

Antenna Centre Insulator by Unadilla/Reyco with built-in lightning arrestor.

- Hang up hook
- Standard Connection
- Weatherized
- Rugged 600 lb. pull
- Use on Vees, Doublets, Quads, Yagis, Folded Dipoles.



THE BIG SIGNAL W2AU BALUN

2 Models

W2AU (1:1) matches
50-75 ohms coax. to
50-75 ohm bal.

W2AU (4:1) matches
50-75 ohms coax. to
200-300 ohms balanced.

- Broadband 3-40 MHz
- 1 KW plus
- Weatherproof
- Lightning arrestor
- Prevents coax radiation and interference
- Balances your antenna current and restores full gain
- Use on inverted Vees, doublets, quads, Yagis.



"the old™ reliable" REYCO

Multiband Antenna Coils

Model	KW-40	40m	(7 MHz)
	KW-20	20m	(14 MHz)
	KW-15	15m	(21 MHz)
	KW-10	10m	(28 MHz)

KW 40 These coils are the standard five band coils to provide operation on 10-15-20-40- and 80 with an approximate length of 108 feet.



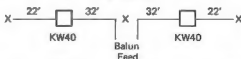
KW 10 KW 15 KW 20

Coils resonant in designated bands to provide perfect dipoles in each band. Using these coils together with a pair of KW-40 coils five band operation can be obtained with a total length between 85 and 95 feet.

SPECIFICATIONS

POWER	2KW PEP (minimum)
WEIGHT	6 ounces (max) PER COIL
SIZE	1.8" dia (max) x 5.5" long (max)
ABSORPTION	WATERPROOF COATING
STRENGTH	300# (min) TENSILE STRENGTH
CORROSION	ALL metals aluminium, including screws, nuts, washers, to resist interface corrosion
HI-Q	OPTIMUM FORM FACTOR ON POLY

USING THE KW-40 COIL AS A FIVE BAND ANTENNA



SCALAR INDUSTRIES PTY LTD

VIC. 20 Shelley Avenue, Kilsyth, 3137. Tel: 725-8677. Cables: WELKIN. Telex: AA34361
N.S.W. 20 The Strand, Penhurst, 2222. Telephone: 578-1392. Telex: AA27067
QLD. Scalar (Qld.) P/L., 969 Ann St., Fortitude Valley, 4006. Tel: 52-2594. Telex: AA43007
W.A. Everett International
17 Northwood St., West Leederville, 6007. Tel: 381-5500. Telex: AA92811



THE "SOLO" VOYAGE

Pieter Arriens VK1PA
22 Eucumbene Drive, Duffy, ACT

"Solo", a 57 foot steel yawl, recently completed a round trip from Sydney to Cape Adare (lat. 71°30'S, long. 170°24'E) on the Antarctic mainland. She called at the very rarely visited Balleny Islands on the way south, and at Macquarie Island on the return journey. In addition to amateur radio, "Solo" carried small ship voluntarily fitted marine HF radio, four "walkie-talkies", a communications receiver and a satellite buoy.

All of this equipment (and a radar set) was thoroughly tested by a cold, wet and salty environment on a 79 day voyage through rough seas to the zone of pack ice which surrounds the Antarctic continent. Portable equipment taken ashore for ship-to-shore communication had to suffer the further indignity of transport on inflatable dinghies through surf.

Some useful lessons were learned, and to put this in context I should perhaps first explain how I came to be involved with radio operations on board "Solo" and in particular with amateur radio. Three summer field seasons with the ANARE (Australian National Antarctic Research Expeditions) had already given useful experience with the operation of field radios in Antarctica, when in 1976 I returned for a year south as Officer-in-Charge of Davis Station. Radio communication was a very important part of station operations, not only with regard to radio telephone, teletype and facsimile services within Antarctica and to Australia, but also for maintaining contact with field parties (and the related question of search-and-rescue procedures). One of the fourteen men at Davis moreover was an amateur operator (David Barrett VK0ZI). The excellent quality of his radiotelephony contacts with amateurs in Australia and elsewhere was a revelation, and planted the seeds of my own future involvement with amateur radio.

In January 1977, the relief ship arrived and the new party changed over with the old. Among those to arrive in the new party was the 1977 radio operator for VLZ Davis, Col Christiansen, who was also an active amateur operator there under the call sign VK0CC. As incoming postmaster, Col brought the first mail the old party had received since the last relief ship called 11 months previously.

One of my letters was from David Lewis, whom I knew in Canberra and from ski-touring in the Snowy Mountains, before he embarked in 1972 on his single-handed voyage to Antarctica on "Icebird". David asked if I was still interested in his plans for an independent expedition to Antarctica in a sailing vessel, for this was something we had discussed in Canberra in 1975 before I left for the year south at Davis.



Adelie and Chinstrap Penguins on Sabrina Island.

Col, too, had met David and was also interested in these plans. A year later, towards the end of his year at Davis, Col was to give great assistance to the "Solo" expedition by splendid radio relay work, both on the amateur bands and as the operator of radio VLZ Davis. But that is to anticipate.

After my return to Australia early in 1977, I became committed to the expedition, and my responsibilities included drafting a scientific program, and making preparations for radio communication. The expedition was beyond David Lewis' personal financial resources, and there were many vicissitudes before an effective organisation was put together to manage the project. It was not until a mere five weeks before departure, that "Solo" was purchased, and at that stage the expedition was critically short of funds and time.

PREPARATIONS FOR RADIO COMMUNICATION

The need for Amateur Radio

It seemed to me, among other things, that amateur radio, especially in the 20 metre band, was an essential thing to have on board a yacht in remote areas of the Southern Ocean. As no other potential crew member was qualified, this gave me an uncomfortable short time before sitting the three AOCP examinations. During this time, the friendly help of many radio amateurs, the clear and concise advice

from the District Radio Officer (John Gore) on the requirements for the AOCP examinations, and the regular WIA morse code broadcasts were all of the utmost help. The call sign VK1PA was obtained in November, which gave just five weeks to purchase amateur radio equipment, mostly secondhand, for use on the expedition.

Equipping the Amateur Station

If "small is beautiful" when it comes to housing radio gear, the Atlas 210X was a likely choice, and it happened that a rig was for sale secondhand through "Amateur Radio Ham-Ads". That settled, the next things required were an aerial tuning unit (Tokyo Hy-Power HC500), SWR meter, CW key, assorted cable and connectors, coax switches, a set of whips for emergency use (Asahi, for 80, 40, 20, 15 and 10 metre bands), and three microphones. The Atlas was thoroughly checked by Ed Penekis (VK1VP) with elaborate test equipment, and apart from requiring some adjustment for carrier suppression, was found to be working entirely within specifications.

A strong metal cupboard measuring 390 x 390 x 300 mm was made from 14 gauge zincanneal and heavy plywood, to house the Atlas, ATU, SWR meter, CW key and microphone. If required the entire rig in its cupboard could have been quickly removed from the cabin for portable use outside, and for this purpose an insulated

base was bolted to the cupboard to provide a mounting base for the Asahi whips. For extra back-up, an early model Yaesu FT101 transceiver, which had seen service on board the "La Balsa" raft, was borrowed for the expedition and kept stowed away in reserve.

Marine Radio

Two 100W Stingray SSB marine radios, fitted with channels for small ships' frequencies up to 6 MHz, and a dual frequency 13 MHz radfone channel, were generously loaned by Findlay Electronics Pty. Ltd. (M. Findlay VK2PW). For reasons which need not be discussed, this equipment was installed at extremely short notice, and crystals for some of the frequencies appropriate for use in contacting Antarctic stations had to be rushed from Singapore.

Three of the crew were examined the day before departure — Lars Larsen and myself for Restricted Certificates in radio-telephony/radio telegraphy, and Jack Pittar in radio telephony. The equipment itself was inspected on the morning of departure, when the radio licence and call sign VJ5754 were issued. The splendid co-operation of the Postal and Telegraph Department, and Mr. Findlay's strenuous work with Jack's assistance in having the Stingray radios installed before the date of departure, are gratefully acknowledged, and resolved what otherwise would have been a difficult situation.

Aerials

"Solo" when purchased had a long wire aerial which ran from the top of the mainmast to the top of the mizzen (triatic stay) and then almost vertically down to the cabin, giving an outside length of about 21 metres. This aerial was used mainly by the Atlas and for general shortwave broadcast reception. A second wire aerial about 5 metres long was installed mainly for use by the Stingray radios. It ran up from the cabin towards the radar scanner which is halfway up the mizzen mast.

Provision had to be made for the contingency that either or both of the masts might be lost if "Solo" were rolled or severely knocked down by a huge breaking sea. Although such an event is unlikely in a yacht of the size of "Solo", the loss of the mizzen mast by itself would have carried away both aerials, and the longer of the two aerials would have gone with dismasting of the main mast. Accordingly, an insulated base which normally served as the feed point for the shorter aerial, was fixed to the cabin roof. A 4 metre whip was carried, and could have been mounted on this insulated base. The screw thread for the Asahi whips was smaller, but an adaptor was turned so that if required the Asahi loaded whips could have been mounted for emergency amateur use.

Power Supplies

"Solo" had two battery systems when purchased. The main batteries were two



Telephoto shot of Cape Adare, with the Admiralty Range rising to nearly 4000 metres in the background.

very large lead-acid accumulators of about 180 ampere hours capacity, which gave a positive earth 24V system for the ship's electrical equipment which included an autopilot, radar, echosounders, sheet winches, lighting, and a bilge water level warning light. Two heavy duty truck batteries, in an entirely separate 24V system, served solely for starting the diesel engine.

When the 100 h.p. Perkins diesel engine ran, two generators, each with its own regulator, separately charged these two battery systems. The main batteries could also be charged by an ancillary petrol-powered generator. This was hardly ever used, because there was another generator which was driven by the free wheeling rotation of the propeller when "Solo" was under sail. This generator was brought into use by releasing a clutch, which decoupled the propeller shaft from the engine. When "Solo" was doing over 5 knots under sail (which she did in almost any wind except when hove to), the propeller generator could deliver up to 8 amps of power to the main 24V system. This was an extremely valuable source of power, which made no noise or exhaust fumes. A portable 150W Honda generator, capable of charging 12V batteries, was also taken on the voyage, but was not used.

An additional pair of heavy duty truck batteries was installed specifically for the radios, among other reasons because the Atlas required a 12V negative earth supply. Apart from this reason, it was desirable to isolate the radio batteries from voltage transients such as would have been introduced by the operation of the heavy electric sheet winches. Separate radio batteries moreover would have allowed one or both of the radio batteries to be removed without disabling any of the ship's electrical

system, if it were wished to operate the amateur rig in a portable mode outside.

Walkie Talkies

Four hand-held 5W Midland AM transceivers were donated by Dick Smith Electronics, for short haul ship-to-shore communication. These were powered either by re-chargable Ni-cads or by dry cells, and operated on a frequency of 27.88 MHz.

Satellite Buoy

The CSIRO Division of Oceanography and Fisheries at Cronulla, NSW, loaned a satellite buoy of the sort used for oceanographic research on seawater temperatures and currents. These buoys are designed to drift behind a sea anchor, and have a panel of solar cells to provide power for the transmitter. Unlike earlier battery-powered designs which incorporated a receiver and transponded when interrogated by the satellite, this design of buoy simply transmitted to a NASA satellite. The transmitter circuitry was entirely enclosed within the sealed 1½ metre long fibreglass buoy, which had an antenna "tail" about ½ metre high also enclosed in fibreglass.

The main purpose of carrying the buoy on board "Solo" was to give at least one satellite position fix daily, accurate to within a kilometre. These positions would be available later (but not in real time for navigation) to make adjustments to interpolated dead reckoning positions on days when cloud or fog prevented taking position in the traditional way by measuring the sun's altitude with a sextant. The satellite buoy was mounted on a steel framework welded to the deck beside the cockpit, and in a very elegant way would have provided means of surveillance of "Solo's" position if all the other radio gear had ceased to work.

Memorandum on Communications

A document giving precise details of all radio equipment on board "Solo" was circulated to various organisations and persons, including the Marine Operations Centre in Canberra, the Antarctic Division in Melbourne, and amateur radio operators.

GENERAL NARRATIVE ON VOYAGE

"Solo" sailed from Sydney Harbour at midday on 15 December, 1977. On board were:—

Dr. David Lewis — Skipper, navigator, medical officer, leader of expedition.

Lars Larsen — First mate, diesel mechanic, radio operator, second-in-charge.

Dr. Pieter Arriens — Responsible for meteorology, geology, and bottom sampling program. Amateur operator and main operator of marine radio.

Dr. Peter Donaldson — Responsible for biological studies, seawater temperature and salinity measurements, film sound recorder and assistant cameraman.

Jack Pittar — Electronics technician, maintained all electric and electronic systems on board. Radio operator.

Ted Rayment — ABC cameraman/film producer.

Fritz Schaumburg — Mountaineer, skier and scuba diver.

Mrs. Dorothy Smith — Mountaineer, major role in galley.

Soon after clearing Sydney Harbour Heads, stormy weather set in, and a very tired crew (after all the intense work before leaving) was at once put to the task of making frequent sail changes. Everyone was short of sleep, and the four hours on, four hours off watch system, although necessary, did not help towards becoming adjusted to shipboard life. In addition to normal deck duties, I had to take weather observations every six hours, and transmit the coded data through OTC coastal stations to the Bureau of Meteorology in Melbourne. The Stingray equipment worked well, and apart from bringing marine weather forecasts, which were useful until "Solo" was out of coastal waters, there were also messages about several small craft which were in difficulties.

No amateur radio transmissions were made during the first six days, owing to problems with charging the radio batteries. On 21 December the log book for the new call sign opened its account with contacts to New Zealand (ZL1CU) and Antarctica (Col VK0CC, at Davis). Daily amateur radio skeds to Australia and Antarctica progressively improved, although as will be detailed in the technical narrative, another three weeks were to pass before problems with charging the radio batteries were finally resolved.

Meanwhile, "Solo" once clear of Tasmania, was favoured by good sailing winds and in one 24 hour period, while passing well to the west of Macquarie Island, she logged 184 nautical miles, and this while still very heavily laden with stores and

emergency fuel. Marine radio telephone contact with the coastal stations became harder as the distance from Australia increased, for the highest small ship frequencies available were in the 6 MHz range. Once past Macquarie Island nearly all the official telegraphic messages from "Solo" (including the four ship's wireless weather reports a day) were passed through VLZ Davis or VJM Macquarie Island, and the OTC coastal stations likewise relayed telegrams for "Solo" through those stations.

Air and seawater temperatures fell as "Solo" moved to higher latitudes, and more and more time was required to change in and out of bulky warm clothing. On 2 January, 1978, as anticipated when seawater temperatures fell below 1°C, the first icebergs were sighted, and a day later pack ice was met at about latitude 63°S. This was less than three weeks

since leaving Sydney, and "Solo", twice a winner of the Sydney-Hobart yacht race, had given a good account of herself.

Further progress south was obstructed for a while by a mass of pack ice congested around the Balleny Islands. There were long fingers of pack ice with deep embayments of open water (on a scale of tens of miles) which made for confusing navigation, especially as the radar set was not working then. Visibility was often poor, and the magnetic compass was wildly unreliable in a steel boat close to the south magnetic pole.

It was soon after meeting the pack ice, when "Solo" was being sailed too fast in fog, that she hit an ice floe. A pea-sized hole was opened under water in one of the plates on the starboard side, about four metres from the bow. The damage was repaired with a patch of neoprene rubber wedged in position — and the whole area



Author Pieter Arriens VK1PA with the yacht's Amateur Radio Installation.

was stabilised with a patch of cement. At no stage was there the slightest difficulty in keeping the bilges pumped dry. Every five minutes or so the bilge water level warning light would come on, and ten to fifteen strokes of one of the hand-pumps would clear the water. The incident, however, gave fair warning that greater care would be needed in negotiating areas of pack ice.

Prior arrangements had been made with the Commander of the US Fleet weather facility, and at our request ice forecasts from the US were sent to McMurdo Station in Antarctica, and relayed by Col Christensen through VLZ Davis. The ice reports were based on satellite microwave imagery which is capable of delineating the boundary of pack ice, even through totally cloudy skies, and our experience every time was to confirm the extraordinary precision of the US ice forecasts. This knowledge made it possible to detour around the pack ice and approach the Balleny Islands through open water from the east. About five days later, Buckle Island was sighted about 8 miles distant across a belt of pack ice, but a strong easterly wind sprang up, and "Solo" was taken away from the island. The wind later veered through the south-east, south-west and finally to the north-west, rising to force 11 on the Beaufort Scale (mean wind speed of 80 knots), when the barometer began to rise from a minimum of 950.9 mb. "Solo" was in open water during the storm, which pushed the margin of the pack ice to the west and south, beyond the Balleny Islands.

When the storm abated and visibility improved on 13 January, Sturge Island, the largest and southernmost in the Balleny group, was sighted downwind. "Solo" was taken close to shore along the east coast to the south-east end of the island, where an excellent anchorage was discovered in less than 10 fathoms of water, at lat. 67° 35'S, long. 84° 50'E. Landings were made on a gravel isthmus which tied a small snow shrouded hill to Sturge Island proper. Many Weddell seals were hauled out on the snow, but no penguins were seen ashore. Ship-to-shore contact was made with the Midland transceivers, one of which was put out of action by immersion in salt water.

Next morning, pack ice was observed moving in from the south, and "Solo" was therefore taken away from the anchorage and back the 20 miles along the east coast. The rest of the coast was hostile, with the ocean swell breaking on rocky shores, and steep slopes rose 500 metres to the corniced edge of an ice cap which covered the top of the island. Several glaciers came down to sea level from the ice cap.

There was open water and good visibility overnight on the way to Buckle Island which was reached next morning. At the south end of Buckle Island, "Solo" was taken to a small island, Sabrina Island, which is tied by a gravel spit to a

spectacular 100 metre high spire of volcanic rock named "the Monolith". Hundreds of Adelle penguins and a few chinstrap penguins occupied a rookery about 50 metres above sea level, and the adults were commuting up and down a steep snow slope to the sea, to gather food for feeding their chicks.

The surf landings to get ashore on the boulder beach had been quite violent, and after a few hours the swell rose further, so it was prudent for those still ashore to return to the ship. The Beaufort inflatable rubber dinghy and 25 h.p. Evinrude outboard motor performed splendidly. Overnight, but still with adequate daylight, "Solo" probed along the east coast of Buckle Island, which was even more forbidding than the coast of Sturge Island. Hanging glaciers came down from the ice cap, and a heavy swell surged along the rocky coast. It was our good fortune on "Solo" to have had good if overcast weather near the island, and the rugged scenery seen in the dim light of the early morning hours left a lasting impression.

Louis Bernacchi, an Australian on Borchgrevink's expedition of 1875-1900, aptly wrote of Buckle Island that "One sight in bad weather of that sinister coast is enough to make a landman dream for weeks of shipwrecks, perils and death".

One rookery of Adelle penguins was perched high up on a ridge, perhaps the only site where a rookery would not be swept away by avalanches breaking from the edge of the ice cap. A predatory Leopard seal was waiting in the water, doubtless succeeding to extract a toll on the traffic of penguins driven to the water to fetch food for their chicks.

Further progress was made for some hours towards Borradaile Island and Young Island, which were visible in the distance north of Buckle Island, but the pack ice was already streaming back eastwards through the gaps between the islands, so a course was set east for the open water which had been our entry to the Balleny Islands. Once back in the open water of the Northern Ross Sea, it was decided on 18 January to turn south for the historic site of Cape Adare on the Antarctic mainland.

It was here Sir James Clark Ross first sighted this part of the Antarctic mainland and named the cape. Over 50 years later the first ever landing on the Antarctic mainland proper was made at Cape Adare, and a few years later, in 1899, the first wintering party to stay ashore in Antarctica built their two huts, and took their provisions ashore. Without radio or any other contact, they watched their relief ship depart for Australia, not to return until the following summer. Twelve years later, the northern part of Scott's ill-fated last expedition built a third hut and spent one winter there.

With great anticipation, therefore to nearly all aboard "Solo" saw the splendid sight

of the Admiralty Range with peaks rising over 4000 metres, on the horizon from at least 70 miles offshore. On 23 January, "Solo" was taken through about half a mile of pack ice to a pool of open water near the Cape, from where landings were made to reach the huts, in two successive sorties with half of the party at a time. Each group had a bare threequarters of an hour ashore. After this briefest of stays and with the glorious backdrop of the Admiralty Range still visible for hours, "Solo" was turned north away from Antarctica.

After two weeks of storms and contrary winds, "Solo" arrived in the vicinity of Macquarie Island, which lay shrouded in fog. Celestial navigation was hindered by fog which concealed the horizon, and cloud which hid the sun. For three days, the exact whereabouts of the island remained a mystery, but much kelp and many penguins in the water, and cormorants flying past the boat, confirmed the close proximity of the island. Perhaps the Macquarie Islanders even began to doubt whether "Solo" would ever make landfall, but then Jack repaired the radar set. The rest was ridiculously easy. We motored in overnight and anchored before dawn on 11 February.

We were given a very warm welcome at Macquarie Island, and the imbounded hospitality of the Islanders was sustained until we left. Simple things like a hot shower or a bunk which stayed still were almost inconceivable luxuries after two months at sea. Members of the crew took turns to keep watch on board, and for two days as a precautionary measure, "Solo" had to be taken out to sea when the wind shifted.

Those ashore could do what they wished, and all found the astonishing range and abundance of wildlife to be a constant delight. I went for a walk, spending two nights away in field huts, and enjoyed fine opportunities for photography. The splendour of hundreds of King penguins (with bright orange markings) parading on vividly green grass must rank as one of nature's wonders. Meanwhile, "Solo" was used as a ferry to carry field stores to huts further south down the island — something which will spare the shore party a good deal of coolie work, because weather conditions did not allow the operation to be done by helicopter while the relief ship "Thala Dan" was there a few days earlier. All too soon the time came to leave, and as "Solo" was the last ship to call until next summer, we took the last mail back to Australia.

The final leg of the voyage back to Sydney took a further toll of torn sails and battered railings, but the progressively warmer temperatures made deck work more pleasant, especially when it became possible to dispense with wearing gloves and bulky clothing. After 79 days the voyage ended on 4 March, 1978, when "Solo" returned to Sydney harbour.

RADIO OPERATIONS

Marine Radio

For the first week from Sydney, all radio contact was made on marine radio channels through OTC coastal stations, including Sydney, Melbourne, Hobart and Adelaide. The contacts became weaker as "Solo" took away from Australia, and ceased altogether beyond 50°S. The highest frequencies available for radio-telephony to the coastal stations were in the 8 MHz range, and our signals too often could not compete with QRM on the crystal locked frequencies.

It is difficult to speak too highly of the sustained effort made by radio operators of the coastal stations (many of them also amateur operators in their own right) to keep contact with "Solo". At times both Sydney and Melbourne stations would listen, each receiving different parts of messages from "Solo" when conditions were very difficult, and would compare notes. From 28 December, 1977, until 22 February, 1978, all commercial traffic through the OTC was relayed via the Antarctic or sub-Antarctic research stations at Davis, Macquarie Island and Campbell Island. Direct contact with Sydney or Melbourne coastal stations was resumed from 23 February until the end of the voyage.

One disappointment concerned the use of a 12 MHz radfone channel, for our signal was always declared to be "non-commercial" by the telephone operators in Sydney. This was despite the fact that the Stingray transceiver was working well on that frequency, as proved by a test transmission to Davis, where Col Christensen reported good signal strength and excellent clarity. Perhaps ocean liners such as the Queen Elizabeth II or the Arcadia, which were in contact with Australia on the same frequencies, had more powerful transmitters.

Radio interference was always far more troublesome on the fixed marine radio frequencies than it was in the amateur bands, where it was usually possible to change to a different frequency. The various generators on board were not properly suppressed, and although noise blankers on the receivers were useful, the best solution was to cut the exciters from the generators, especially when working the lower frequencies. Sometimes when motoring, even that was not sufficient, and it was then better if possible to stop the engine, because apart from electrical interference, the motor was noisy inside the cabin.

Amateur Radio

Amateur radio transmissions did not begin until six days after leaving Sydney. This was to conserve the radio batteries until proper provision had been made for charging them. Jack Pittar installed a system of relays which switched the two 12V radio batteries in parallel while the radios were used (-ve earth) and in series for charging in parallel with the +ve earth

24V main bank of batteries. At first it seemed this excellent arrangement was working well, but after a few days it became impossible to avoid doubts whether the radio batteries were receiving enough charging current, and these doubts remained after adjusting the regulators of the sailing/prop generator and the generator driven by the diesel engine.

Possibly the ship's main batteries of 180 ampere hours capacity, being older, charged at a lower voltage than the brand new radio batteries, so that the radio batteries never charged to their nominal capacity of 60 ampere hours each. Whether or not this was so, it became more and more certain that the radio batteries were starved, and from time to time as an experiment, the main batteries were isolated to pass all the charging current to the radio batteries. This could be done only in stable weather conditions, and it had to be made clear to the deck crew that the slightest touch of a foot switch for either of the sheet winches would blow out the relays.

These are simple enough matters to discuss in theory and with hindsight. But in practice, when the batteries are down in the bilges under large plywood floor panels, which in turn are under a heap of assorted boots and Honda generator with nowhere else to go, and when access to soldering irons and electrical equipment requires disturbing very tired crew members to reach lockers behind or underneath bunks, and when anything left unattended for a moment is hurried across the cabin by the next large wave, and when it is very soon again time for dinner or the next watch before much rewiring can be done, then such tasks become major and long undertakings. Jack also had a misfortune while cleaning the hydrometer on deck, when the glass cylindrical portion containing the graduated fluid decided to part company with the rubber suction bulb. He was naturally holding the rubber bulb with due care and attention, but the rest of the hydrometer most exasperatingly began an irretrievable journey to the bottom of the Southern Ocean.

The symptoms during skeds on the Atlas were decreasing power output, progressively higher SWR ratio, and of course reports of declining signal strength and intelligibility during a QSO. But the Atlas has a protective mechanism whereby power is reduced at higher SWR, and the aerial of necessity passed through numerous connectors and a coax switch, to share duty for the Drake communications receiver, or the Stingray marine radios. So the aerial system for a while also had to be regarded as a possible source of trouble, but curiously the aerial always tuned nicely with 1:1 SWR at the beginning of skeds.

Naturally the amateurs at the receiving end would then suggest that both stations should change to CW. Now the "ham

shack" area in "Solo" was on top of a large locker containing wet weather gear, beside which one stood none too securely on the starboard side of the cabin, in a posture which depended very much on which tack "Solo" was sailing. On starboard tack the radio cupboard was "up-hill" and there was a recurrent tendency for log books or message pads to be hurled on to the floor. On port tack there was less of a problem, but then occasionally an uncongealed chesscake would flip across from the port side galley into the radio area or else seawater would spill in from a ventilator.

It is one thing for a tenderfoot Morse operator to take CW on a message pad letter for letter seated at a steady desk on land. It is quite something else to do it standing in a small boat at sea with one hand preoccupied holding on to a bulkhead, and the other occasionally fielding message pads, etc., before they escape over the edge of the working area. Sending CW was less of a problem than receiving, because the HK706 Morse key has an excellent rubber base and slung to the work area. I found it distracting at first not to have side tone, for I had never practised sending Morse without an audio oscillator. For all these problems, it was very fortunate that the Atlas transmitted clearly if weakly on CW, after radio-telephony had become quite unintelligible, and other stations always reported excellent tone on CW.

A few operators reported distorted modulation during some of the earlier phone contacts, and this raised further doubts about the ALC setting or the microphone. Changing microphones often led to a temporary improvement; with hindsight this was not so much because the previous microphone was malfunctioning, but probably because the batteries recovered somewhat before transmission resumed. Battery voltages were always excellent when tested before skeds, but the true state of the radio batteries became more evident after one particularly difficult sked, when the two radio batteries, each of nominal 60 ampere hour capacity, gave 8V. Incidentally, the Atlas was still transmitting readable CW!

At the same time, however, another potentially serious problem lay in the decreasing temperatures, which had fallen to about 2° or 3°C inside the cabin. Steam from cooking in the galley happily filled the cabin and condensed profusely on any cold surfaces, and microphones which unavoidably became damp failed to dry out.

Fortunately there was no overall shortage of electric power from the free-wheel prop generator or from the diesel engine when moving under power, and this led to a much simplified method of charging the radio batteries, which at the same time countered the cold-wet environment for the Atlas and its accessories. The radio batteries were now left in parallel, and

two 12V light bulbs of about 12 watts each were wired in parallel, giving a resistance when hot of about 6 ohms. These bulbs were mounted low inside the cupboard housing the Atlas, and were used as a dropping resistor to charge the radio batteries at current of 2 amps from the ship's main 24V batteries.

The beauty of this simple arrangement was the certitude that if the bulbs were shining, the radio batteries had to be charging. At the same time the Atlas and associated gear (especially the microphone) warmed up to about 11°C inside the cupboard, and this kept the rig dry when conditions were damp or even positively wet in the cabin. One of three multimeters on board was mounted on a bulkhead and wired to continuously measure the voltage of the radio batteries. This, without the services of the lamented hydrometer, helped to monitor the condition of the radio batteries.

By mid-January, normal performance of the Atlas, with 1:1 SWR right across the 20m band, full power output, and excellent signal reports for readability (5) and strength (at times peaking over 9), all confirmed that the earlier problems had their origin in the chronically starved condition of the radio batteries. There were still some vagaries of propagation and perhaps occasional Antarctic flutter, but good contacts became the rule rather than the exception.

Although no attempt was made to operate DX for its own sake, it never proved necessary to close VK1PA/MM while other stations still wished to make contact. Perhaps a VK1 operating mobile marine outside Lake Burley Griffin was too much of a rarity to be recognisable as an unusual contact, yet at Cape Adare "Solo" was about 200 miles further south than any of the VK0s at the ANARE stations.

Over 200 amateur contacts were made during the voyage — 130 of them with six stations (VK0CC, VK1BH, VK1DL, VK1GB, VK2AAB and VK2HH).

It was often apparent that other amateur stations were listening on the slide, without calling, and this was much appreciated as it strengthened surveillance of the expedition when it was working in very isolated waters.

The first amateur contacts were made on 21 December, and included an excellent QSO with Colin Christiansen (VK0CC) at Davis. Colin had the advantage of the gain of a large rhombic antenna in a very quiet area, and was often able to hear my signals better than at amateur stations in Australia. He therefore often took control of a radio net which evolved initially with other stations in Sydney and Canberra, and later extended to Ballarat, Victoria. Daily contact was attempted every evening except for one day while I was ashore on Sturge Island in the Balleny Group, and for six days when the net was sus-



"Solo" at anchor in Buckles Bay, Macquarie Island. On the left the slopes rise towards Wireless Hill, the site of Sir Douglas Mawson's radio masts for the relay station for communication to Commonwealth Bay on the Antarctic Mainland.

pended while "Solo" was at or near Macquarie Island. Of the sixty-six remaining days, there were only six when attempts to make amateur contact failed for technical reasons which originated either with the radio batteries or through difficulties with propagation on the 20m or alternative bands.

Under circumstances where the value of amateur radio lay so much in reliable daily communication, it is perhaps invidious to identify any specific QSO, but it was a memorable day when an hour-long contact was made with VK2HH aeronautical mobile (Harry Hocking) on a QANTAS Boeing 747 which at that time was flying over Cape Adare where "Solo" had called a week earlier. Wives and friends of the crew on "Solo" were in the aircraft, and enjoyed the chance to talk to each other through the amateur radio service.

Nearly all of the amateur contacts were made in the 20m band, although the 80, 40 and 15m bands were also worked, in all instances using the longer of the two aeriels. On the final return leg to Sydney, "Solo" made extremely fast progress across the Tasman Sea, and before arrangements had been made to use alternative frequencies in the 40 or 80m band, it was discovered one evening that all the usual east Australian stations of the net could not be heard on 20m, and presumably lay inside the skip zone. Fortunately a VK6 station was in 20m contact with one of the VK1s and was able to QSP an alternative frequency to be used in the 40m band.

Communication with Antarctic Research Stations

After "Solo" lost contact with the OTC coastal stations in Australia, the only means of passing official third party traffic was by relay through Antarctic research stations. It was known in advance that two of the frequencies allocated to ANARE stations were accessible on the Atlas, and appropriate consultation was made beforehand. Naturally other ANARE traffic took precedence, but with prior amateur radio contact, it was possible to confirm whether the ANARE frequencies were free.

Colin Christiansen, as the operator of radio VLZ Davis, was therefore able to relay messages to Australia, and also to the United States Fleet weather facility via McMurdo Station. This made it possible to despatch ship wireless weather reports from VJ6764 "Solo", and to receive ice forecasts from the Americans. Unfortunately there was no amateur operator at Macquarie Island, and it therefore proved harder to maintain effective long-range communication with Macquarie Island, except paradoxically by relay through Davis.

The final contact with Colin was on 12 January, when the Davis 1977 party returned to Australia, but the new radio operator and the previous radio technical officer, who stayed on at Davis for the summer, continued to work "Solo" until 7 February Davis station therefore played a key role for more than half of the voyage on "Solo". Radio traffic and weather reports were relayed from 8 February through Macquarie Island, until

"Solo" anchored there, and again for a few days after leaving Macquarie Island. Good contact was also made with the New Zealanders at radio ZLBC Campbell Island, and continued for several days after contact was lost with Macquarie Island. From 23 February, direct contact was resumed with Sydney and Melbourne coastal stations, until the end of the voyage.

Social radio contacts were also made with the ANARE relief ships "Nella Dan" and "Tha-a Dan".

Ship-to-Shore Communication

The hand-held 27 MHz equipment gave good contact between "Solo" and parties going ashore in the inflatable rubber dinghy. One of the four sets was put out of service by saltwater immersion when the rubber dinghy was swamped during a fairly rough landing through heavy surf.

Satellite Buoy

The CSIRO's satellite buoy, named "Snow Petrel" apparently functioned throughout the voyage, so it was possible after the voyage to compare the satellite positions with those obtained by the traditional methods of celestial navigation.

Finder

"Solo" carried marine radar with a range of 24 miles. The scanner was mounted on the mizzen mast, and the screen and control unit was in the cabin, located above and even nearer to the galley than the radios. Although working normally before departure from Sydney, the radar unfortunately did not operate for most of the voyage, including all the time in fog-bound waters off the Balleny Islands, where there was much peak ice.

Jack followed the trouble-shooting procedures in the manual — which involved some work inside the scanner unit up the mizzen mast, but this was not successful. On the return journey near Macquarie Island, Jack found a resistor which must have been overheated earlier, for it had become open circuited through desoldering. The fact that the radar set performed perfectly after the resistor was soldered back in position (apart from continued overloading of this component) speaks very highly of the equipment, which had been enveloped every day by steam from the galley.

SUMMARY AND CONCLUSIONS

1. A heavy shibboleth still cited with conviction by some latter day ancient mariners, is that HF radio is utterly untrustworthy and unnecessary on board cruising yachts. The voyage on "Solo" lasted for 79 days. During the voyage, HF communication to Australia and/or Antarctica was made on 79 of those days.
2. Morale, not only on board "Solo", but also among friends and relatives in Australia was greatly helped by radio communication. The ice forecasts received by radio were of crucial assistance to navigation in the fog-bound waters off the Balleny Islands.



Stingray Marine Radio Equipment on board "Solo", provided by Findlay Electronics.

3. Time was so short after the purchase of "Solo" that not all of the radio installation work was finished before departure. Apart from the extra effort it took to complete the work at sea, the shortage of time also meant accepting some compromise on the position where the radios were installed. It would have been vastly preferable if the radios could have been mounted to allow the operator to sit securely, or even lie in a bunk, instead of standing.
4. In the cold and wet conditions of high latitudes at sea, it is essential to house non-marine amateur radio equipment in a weatherproof cupboard with provision for heating. The better insulated the cupboard, the less power will be required for heating. Apart from attention to power supplies and airtightness, nothing else will help so much towards enjoying good performance from amateur radio transceivers, and communications receivers in small ships at sea.
5. Radio-telephony is very convenient and preferable to use when conditions are good, but many of the contacts would have failed without telegraphy. Possibly as much as half of the traffic to Davis was passed by CW.
6. A long wire aerial works extremely effectively at sea over salt water, when properly tuned with an aerial coupler.
7. The precaution of taking alternative whip antennas and a reserve amateur transceiver was entirely justified, although no emergency arose requiring their use.
8. The legal restrictions on third party traffic through the amateur service seemed especially inappropriate at

the time "Solo" was out of direct communication through commercial channels to Australia. When third party traffic did reach relatives and friends in Australia, the news was spread by cascades of trunk telephone calls in Australia. If radio relay rights were explicitly granted to the amateur service in Australia, the net result without doubt would be a further increase to the already handsome profits of Telecom.

9. As a newcomer to the amateur service, may I again acknowledge the friendly advice and useful information from "old hands", without which I should have been much less likely to have obtained the necessary qualifications and suitable equipment to operate a maritime mobile amateur station.
10. May I record my heartfelt thanks to all the radio operators who worked "Solo", whether in the amateur service, the OTC coastal stations or at Davis, Macquarie Island and Campbell Island. Their skills and persistent application contributed very much to the success and welfare of the expedition.

Reproduced by permission from *Forward Bias*, June 1978.

QSP

IMPORT BAN ON "ILLEGAL" CB RADIOS CONSIDERED

The Federal Government may ban imports of "illegal" Citizens Band radio sets into Australia, the Minister for Post and Telecommunications, Mr Staley, said. He said it was wrong that CB radios could be imported when they could not be licensed.

"I have had some discussions with the Minister for Business and Consumer Affairs, Mr Pitt, on what action could be taken to end what in general is an undesirable practice", he said, replying to a question without notice from the Deputy Opposition Leader, Mr Lionel Bowen.

Mr Bowen asked about a decision by Mr Staley's department last December to license 20,000 CB sets imported from Taiwan for Australian General Electric. Mr Bowen wanted to know who authorised importation of the sets, in view of the technical inferiority and the fact that they cause severe interference to normal radio and television reception.

Australian General Electric had made \$1 million from sales of the sets, he said.

Mr Staley said he was not familiar with the matter and would make enquiries.

AMATEUR LICENCES

From 1/2/78 the annual licence fees were increased by 16 per cent. The amateur licence became \$9.40 which is approximately equivalent to \$10.40 at present exchange rates. Annual licence fees for some of the other services are now \$2.80 for model control, \$8.40 for ship licences, \$4.80 for aircraft licences and \$7.50 for each of the first two private mobile radio stations and \$4.20 for each subsequent station.

Are you checking our bands for INTRUDERS

AND REPORTING SAME TO THE INTRUDER WATCH CO-ORDINATOR?

All rigs pre-delivery checked!



KENWOOD TS-520S SSB transceiver

TS-520S features • 160 thru 10 meter coverage • Optional DG-5 frequency display (on top of unit) • New speech processor with audio compression amp. • Built-in AC power supply (AC-DC converter optional) • RF attenuator

789.00

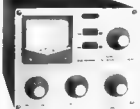
KENWOOD

SM220 station monitor	\$335.00
AT206 antenna tuning unit	\$185.00
TS820S HF transceiver with digital display	\$1279.00
SP820 matching speaker plus filters for TS820	\$66.00
VF820 matching VFO for TS820 series	\$179.00
DS 1A dc converter for TS820S TS520S	\$79.00
TS520S HF transceiver 160-10m	\$789.00
VF620S matching VFO for TS520S transceiver	\$39.00
SP520 matching speaker for TS520S	\$206.00
DG 5 digital display for TS520 series	\$236.00
TV506 6m transceiver	\$245.00
TV502 2m transceiver	\$290.00
TV502S 2m 1st antenna	\$890.00
TS700SP 2m all mode transceiver	\$25.00
VOX 3 VOX unit for TS400 series	\$229.00
TR7200 30cm fm portable transceiver	\$469.00
TR7400A 2m digital mobile fm transceiver	\$399.00
TR7500 2m synthesized fm transceiver	\$260.00
R 300 general coverage communications receiver	\$58.00
MC 56 desk microphone	\$20.00
MC 35S att hand mic high Z	\$34.00
HL 222 HF linear amplifier	POA

DAIWA HAVE RELEASED A NEW RANGE OF QUALITY ANTENNA TUNERS

WITH CROSS-NEEDLE SWR/PWR METER
MODE: CNW 217
Freq coverage 1.8 thru 30MHz
1 input power 100w CW 200w afo
Input impedance 50 ohms unbalanced
Output impedance 10 300 ohm unbalanced
P ccl \$179.00

MODEL CNW 417
1.8 thru 30MHz
200w CW 500w ppo
80 ohms unbalanced
10 300 ohm unbalanced
\$219.00



VLF CONVERTER

NEW



- New device opens up the world of Very Low Frequency radio
- Gives reception of the 175 meter band at 160-160 kHz where transmitters of this power can be operated without FCC license
- Also covers the navigation radio beacon band standard frequency broadcasts ship-bore communications, and the European low frequency broadcast band

The converter moves all these signals to the 30 meter amateur band where they can be tuned in on an ordinary shortwave receiver

The converter is simple to use and has no tuning adjustments. Tuning of VLF signals is done entirely by the receiver which picks up 10 kHz signals at 1570 kHz, 150 kHz signals at 3600 kHz, 300 kHz signals at 4000 kHz.

The VLF converter has crystal control for accurate frequency conversion, a low noise IF amplifier for high sensitivity, and a microphone for to cu. broadcast and 80 meter monitoring.

A high performance 5 packed into a small 3 x 11 x 9.5 inch aluminum case with a JHF (50-750) connectors.

The in-circuit Engineer's circuit eliminates the complex bandswitching and tuning adjustments usually found in VLF converters. It also offers 20-40 dB gain for reception.

89.00 Call for yours today

TRAP VERTICALS

NAGARA V4x 40 10m, 5.2m high, no guys \$89.00
NAGARA V5x 80 10m, 5.2m high, no guys \$139.00

TRAP DIPOLES

RAK Midy Vm 80 10m trap horizontal, 23m long \$103.00
RAK AL480XN 40/80m trap dipole \$82.00

JAYBEAM ANTENNAS

88/70 58 el for 70cm, 18.5dB gain \$98.00
48/70 48 el for 70cm, 15.7dB gain \$78.00
PM18/70 18 el, 70cm, 14.9dB gain \$69.00
D8/70cm twin 8 el for 70cm, 12.3dB gain \$58.00
8V/2m 8 el 2m, 7.8dB gain \$35.00
8V/2m 8 el 2m, 5.5dB gain \$45.00

DISCONE ANTENNA

GDX 1 80-480MHz commercial disccone \$79.00

PARABOLIC DISHES

Daves PBA 1200 20cm and 1 2GHz, complete \$245.00

SCALAR

M227 1/2 wave 2m mobile whip, top only \$7.00
M25 1/2 wave 2m mobile whip, top only \$17.50
— base for above \$4.00

VALVES

6J56C for FT101 series \$12.00
6A156B for Kenwood Uniden \$13.00
6KD6 for early Yaesu linears \$13.00
572B for Yaesu linears \$55.00

bankcard

TRADE-INS ACCEPTED



DINERS CLUB

ICOM

IC701 HF solid-state 160-10m transceiver	\$1180.00
IC701P5 matching power supply, speaker	\$245.00
IC202E 2m sbb portable transceiver 3 watts	\$219.00
IC502 2m sbb portable transceiver 3 watts	\$219.00
IC225 2m fm synthesized mobile transceiver	\$785.00
IC211 2m fm mode sbb transceiver	\$245.00
IC245 2m fm fm mode sbb transceiver	\$465.00
— sbb adapter for above	\$142.00
RM3 remote control for Icom Dv 211 245	\$169.00
8C20 8 card pack, AC charge for portables	\$59.00
IC50M2 car driver ext. net in telephone base	\$56.00
IC50L 6m 10w near zero 1st	\$98.00

accessories

PROCESSORS & COMPRESSORS	
RF440 Speech processor phat ng type 8dB gain	\$125.00
RF550 Speech processor crv at 1st type	\$165.00

MORSE KEYS

HK702 dc key w/4th marble base	\$38.00
HK708 economy key	\$21.00
HK706 operator's key	\$25.00
HK701 suboperator's key	\$43.00
SK1032 electronic keyer	\$165.00
IC KEYS (Palmox)	\$149.00

MICROPHONES

VM 1 noise-canceling dynamic low Z	\$9.50
VM 2 desk mic with pre-amp dynamic low Z	\$29.80

SWR/PWR METERS

VC2 two meters, 3 150MHz w/4th cal brat on ch 1	\$34.00
Oxerbrook SWR200 3 200MHz	\$75.00
2 200 2000 watts	\$75.00
SW410A VHF-UHF, full ly direct reading	\$105.00
SW210A 1.8 thru 150MHz 20 200w, d rect reading	\$85.00
SWX 777 professional 1.8 thru 30MHz direct reading	\$131.00

ANTENNA CHANGE-OVER RELAYS

CX 2L 1.8 thru 170MHz 100w zap max	\$69.00
CX 2H 1.8 thru 450MHz 200w zap max	\$69.00

COAXIAL SWITCHES

C5201 3 pole/throw, high pwr, up to 500MHz	\$24.00
C5201 4 position, high pwr, up to 500MHz	\$49.00

LOW PASS FILTERS (DAIWA)

F030M 32MHz Fc 100w, 3 stages good quality	\$32.00
F030L 32MHz Fc 200w, 3 stages good quality	\$22.00

NOISE BRIDGES

Omaga TET-01 up to 100MHz	\$44.00
Palmox up to 100MHz	\$79.00

QMT7 PRODUCTS

CONVERTERS	(28MHz F)	132MHz
		\$59.00
		\$88.00
		\$70.00
		\$55.00

TRANSVERTERS

High pwr SCORPION	\$225.00
28MHz IF	\$125.00
2m/432MHz	\$129.00
2m 70w zap max	\$129.00

LINEARS

2m ANTENNAS

The RINGO RANGER ARX 2 is a 2M gain omnidirectional antenna with three half waves in phase and a one-eight wave matching stub. The Ringo Ranger gives an extremely low angle of radiation for better signal coverage. It is suitable over a broad frequency range and perfectly matched to 52 ohm coax. Price \$48

RINGO

Head Office and Ma Orders
vicom Ph (03) 699.6700
68 Eastern Road
Sth Melbourne Vic. 3205

Adelaide 43 7981 Canberra 82 3581 Perth 446 3332 Brisbane 38 4480 Hobart 43 6337

Direction Russell J Kelly
Peter D Williams

DINERS CLUB

sydney customers:

Our Sydney Area Dealer is:
CUSTOM COMMUNICATIONS
TELEPHONE. 632.3744

Who will be happy to supply the VICOM
Product Range including quality ICOM
Transceivers.

An invitation to join the **TEN-TEC**

"Argonaut Club"

TEN-TEC Argonaut 509

Tired of push-button QSOs? Had it with the KW killers? The almost too easy life of power hamming? Then the excitement of Argonauting is for you. The QRPP world is different. A challenge? Of course. The test of an operator? Perhaps. But above all it is the thrill of working the world with 5 watts.

The Argonaut club is exclusive, not everyone is a member. But if you enjoy the spirit of conquering distance with lower power, you are "in." There are no dues — just the price of an Argonaut.

Join the thousands of fellow members in the Argonaut club, get in on the Argo fun. Your membership awaits you at your Ten-Tec dealer.

SPECIFICATIONS:

Five band, 3.5-30 MHz SSB and CW modes. $\frac{1}{2}$ μ V receiver sensitivity. 5 watts transmitter final input. Fully solid-state. Permeability tuning. Instant break-in. Instant band change without tune-up. Receiver offset tuning. Automatic sideband selection, reversible. Direct frequency readout. Built-in SWR bridge. S-Meter. WWV receive. Internal speaker. Plug-in circuit boards. 12-14 VDC or AC supply power. Wt. 6 lbs. Size HWD 4 $\frac{1}{2}$ " x 13" x 7".



509 ARGONAUT TRANSCEIVER	\$405.00
215-P CERAMIC MICROPHONE	\$ 45.00
A.&R. PS-353 P. SUPPLY	\$ 38.00

Of Course . . . You can Add the Matching Linear Amplifier in the Future. Please Phone, Write or Call, for Further Particulars of the Range.

graham e. stallard

27 WHITE AVE. LOCKLEYS 5032
SOUTH AUSTRALIA - PHONE 43 7981

Authorized Distributor
for

TEN-TEC



Sideband Electronics Sales

DISTRIBUTORS OF COMMUNICATION
TRANSCEIVERS

NEW! SKY-BAND MOBILE ANTENNAS

THIS NEWLY DESIGNED UNIQUE MOBILE ANTENNA HELICALLY WOUND EXTRA HEAVY DUTY. SIX FEET LONG, AND CAN HANDLE UP TO 400 WATTS P.E.P.

FEATURES:

Light weight.
S.W.R. better than 1:1.05 at resonance
Covered with highest grade fireproof insulation
Chrome base with 3/8 24 tpi. thread
Available in colours, grey, white, blue, green
burnt orange, brown and black.

AVAILABLE:

SKY. 80M 3.5 Special Novice
3.65
SKY. 40M 7.06
SKY. 20 14.150
SKY. 15 21.100 and up.
SKY. 10 28.5 and up

PRICE LIST:

SKY 80 6 feet long 3.5 MHz \$28
SKY 40 6 feet long 7.060 \$26
SKY 20 6 feet long 14.150 \$26
SKY 15 6 feet long 21.100 \$25
SKY 10 6 feet long 28.500 \$24
Swivel mounts and chrome
plated springs for all \$13

All Sky-Band Antennas are carefully designed and have been individually tested. High quality fibreglass rod, wound with optimum thickness of wire to keep weight down, but maintain High Q. An elegant design to those who only want the best. All antennas are factory tuned for the lowest portion of the desired band and can simply be trimmed for your chosen frequency. Yes it is all Australian made! You don't pay for large overheads, instead we use the best material available and offer a mobile antenna which will resonate to our frequencies, unlike the previous overseas designed antennas.

ORDER NOW AND SPECIFY THE COLOUR YOU REQUIRE

New designs on the way similar to the famous 'Band Spanner' from 80-10 metres, tunable centre loaded, to be released soon.



SEND FOR A FREE CATALOGUE AND PRICE LIST



SALES & SERVICE 24 KURRI ST., LOFTUS. N.S.W. | OPEN SATURDAYS TILL
P.O. BOX 184, SUTHERLAND. 2232 | NOON. Phone: 521-7573

TEST REPORT

We Don't Claim That Your ALPHA Linear
Will Run A Kilowatt Key-Down FOREVER . . .



... But We Don't Put A Time Limit On It, Either.

YOU'LL PROBABLY NEVER SET A BRICK ON YOUR KEY FOR 26,000 MINUTES, BUT WE DID IT TO ILLUSTRATE WHAT ETO'S NO TIME LIMIT (NTL) CONTINUOUS DUTY RATINGS REALLY MEAN TO EVERY ALPHA AMPLIFIER OWNER.

April 7th: A standard ALPHA 76 was taken from production, loaded up to a full 1000 watts key-down do input, and left operating with a brick on the key.

April 26th: The '76 was still operating completely normally, delivering about 675 watts of continuous rf carrier output into a very hot dummy load — after 18 days — 435 hours — some 26,000 consecutive minutes key-down at a full kilowatt. You may have seen the same unit running key-down all day long the following week-end at the Dayton Hamvention. It's still as good as new — a fact which will surprise no one who knows how all ALPHA's are built. You'd expect no less.

The point is, every ALPHA linear amplifier — including the power- and value-packed ALPHA 76 and the exclusive NO-TUNE-UP ALPHA 374 — is meticulously engineered and built to handle continuous operation IN ANY MODE AT MAXIMUM LEGAL POWER (NTL) . . . No Time Limit.

MODEL 76P

ALPHA

MODEL 374

LINEAR HF
AMPLIFIERS

ALPHA: SURE YOU CAN BUY A CHEAPER LINEAR . . . BUT IS THAT REALLY WHAT YOU WANT?

A LINEAR AMPLIFIER IS A BIG INVESTMENT . . . MAKE IT WISELY. For an enlightening glimpse at what goes into the design of every ALPHA by ETO's power professionals, or to aid you in comparing one linear with another, call or write for our brief guide entitled, "EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT (COMPARING) LINEARS . . . BUT DIDN'T KNOW WHOM TO ASK." We'll also send you fully detailed and illustrated literature describing the entire ETO line of superb ALPHA power amplifiers and ALPHA/VOMAX — the new split-band speech processor that's your key to rf clipper type "talk power" combined with easy mike-line installation and low-distortion, practically foolproof operation.

AUSTRALIAN SOUND AND SIGNAL RESEARCH

P.O. BOX 5076 G.P.O. SYDNEY 2001

Enquiries: JAMES GOODGER VK2JO. TELEPHONE SYDNEY (02) 36 7756

EQUIPMENT REVIEW:

THE ASTRO 200 SSB TRANSCEIVER

When Peter Schultz of Sideband Electronics Sales, Loftus, NSW, offered us an ASTRO 200 transceiver to try out, we quickly accepted. In spite of quite extensive advertising in Amateur Radio magazine, the ASTRO seems to be almost unknown amongst active amateur operators. Introduced into this country with a full page advertisement in the November 1976 issue of AR and followed with a double page spread in the March 1977 issue, it must remain a mystery just why this is so.

Well, just what is the ASTRO 200? In a few words, it is a miniaturised 100 watt output 80 to 10 metre transceiver with fully synthesized tuning. There is a lot more to be told, of course, but before that, let's go back a few years and look at the development of the amateur band transceiver as we know it today. One would be excused for thinking that the amateur transceiver was a Japanese invention and had been developed to its present state in that country.

Not so. The transceiver was devised in the United States and to date every new development in its history has come from the United States. This of course infers that the ASTRO is a product of the United States, which it certainly is. The manufacturer is CIR Industries Inc., of California. However, let's get back to the transceiver itself and see just what sets it apart from the others. Two things stand out straight away. Tuning is fully synthesized, that is, the bands are covered in 100 Hz steps rather than continuously as with a conventional VFO system. The manufacturer claims that the ASTRO has 40,000 channels. He is probably right, but we didn't count them.

The next and probably the most revolutionary development is that there is no conventional tuning system. Tuning is accomplished by a scanning device operated by spring loaded switches. A fast and slow scanning rate is provided to enable either quick excursions from one portion of the band to another for easy SSB resolution.

Reference to the illustration will give a good idea of its relative size. The Astatic D-104 microphone looks huge in comparison. The actual dimensions of the ASTRO are 7.2 cm high, 30.8 cm deep and 24.13 cm wide and the weight only 3.6 kg. There is of course no AC power supply built in, the transceiver being designed primarily as a mobile unit or for home station use with an external high current DC supply. Nominal operating voltage is 12 to 14 volts.

As there is no conventional tuning system it follows that the frequency readout is digital. A six digit readout gives



100 Hz resolution. The brightness of the readout can be reduced for night time operation.

Most of the usual facilities we expect to find in modern transceivers are included in the ASTRO. These include: VOX or PTT, built-in SWR meter, noise blanker, RF attenuator on receive, fine tuning control or VXO to tune between the 100 Hz points, a separate receiver offset tuning control and an entirely separate WWV receiver on 10 MHz. Perhaps one of the more interesting features is the inclusion of an in-line RF power meter to actually read the output power in watts.

TECHNICAL FEATURES OF THE ASTRO 200

From the above it is obvious that the ASTRO is no run-of-the-mill transceiver, so a closer look at the circuitry is of great interest.

The set is made up with good quality plug-in circuit boards and the overall internal appearance is clean and orderly. At a guess it would seem that the manufacturers, CIR Industries, have a background of high quality commercial manufacture. The receiver is a single conversion design with a 5.6 MHz IF frequency. Gain in front of the 8 pole crystal filter is kept low with a dual gate MOS FET RF stage driving a double balanced mixer stage. PIN diodes are used in the AGC circuit and a dynamic range of greater than 100 dB is claimed. The switched RF attenuator increases this to over 120 dB. Perhaps an

unusual omission, however, is a normal RF gain control and a strange inclusion is a squelch control. The eight pole filter has 1:8 shape factor with a 2700 Hz bandpass at the 6 dB points, and 4900 Hz at the 60 dB points. Diode switching is employed in selecting either the SSB or CW filter. The well known LM-380 is used as the receive audio output chip.

RF bandpass filtering is switched into the receiver front end with the transceiver band switch, and as is common with modern solid state design, no peaking or front end tuning controls are provided or needed for either transmitter or receiver.

The transmitter line up is straightforward and uses the same 5.6 MHz filter as used in the receiver. The power output section uses three stages with the last two in push-pull. All the transmitter stages are broadbanded with separate bandpass filters switched in for each band. Considerable attention has been given to TVI suppression and general spurious output. Double balanced mixers are used throughout both transmitter and receiver, and in addition to the bandpass filters in the transmitter output and receiver input, a three section low-pass filter is included at the transmitter output.

Some form of speech processing is considered essential these days, and the ASTRO uses a very interesting approach. Incorporated in the microphone is a logarithmic compressor followed by a 3 kHz filter. The design then allows the final

transmitter stage to be over-driven to produce a degree of controlled RF compression. We shall see later just how effective this is.

The heart of the whole transceiver is of course the frequency synthesizer. In effect the synthesizer generates crystal controlled frequencies in 100 Hz steps for each of the amateur bands. The basis of all this is a very stable 5 MHz crystal oscillator driving two phase locked loops. The major PLL generates the heterodyne frequencies to convert the received and transmitted signals to and from the 5.6 MHz IF channel. This loop also generates the 100 Hz steps from a programming code and an up/down counter. The up/down counter is in turn controlled by the front panel frequency selecting switches.

THE ASTRO 200 IN OPERATION

Sideband Electronics Sales kindly loaned us a heavy duty 20 amp 13.8 volt power supply to use with the ASTRO. For home station use a similar type of power supply would be needed.

Used in the car, however, the average current drain over a period of time would be quite low. At 200 watts peak input the drain would be something over 15 amps, but as this would only occur on absolute speech peaks, the drain as measured on a normal ammeter does not exceed about six amps. With full use of the speech processor this would rise to about ten amps. Even so, a normal car battery in reasonable condition would operate the ASTRO for the duration of the field day and still start the car after.

When the ASTRO is first turned on, it takes several seconds for the PLLs to actually lock. During this time signals rush back and forth in random fashion. Tuning the ASTRO is a new experience and certainly takes time to master. The tuning switches are three position spring-loaded with centre normal. Fast tunes at a rate of 10 kHz per second, ideal for hopping from one end of the band to the other. Pushing the switches up increases the frequency, while pushing down has the opposite effect. The SLOW switch tunes at the rate of 400 Hz per second. After a few minutes practice one becomes expert and the whole thing becomes easy albeit strange to operate. While all this is happening the digital readout is showing the exact frequency.

Received audio quality was excellent and strong signal handling first class. As mentioned earlier no RF gain control is included. As a personal choice I would swap the squelch control for one. When listening to strong signals I normally prefer to reduce the RF gain and benefit from the quiet background so obtained. The RF attenuator included in the set did not provide this effect. However in all other respects the receiver was pleasant to operate. The noise blander was effective on ignition type noise but did introduce some cross modulation particularly on the eighty metre band at night when signals

can be extremely strong. The WWV receiver built in is definitely a "Why didn't they think of it before". A separate direct conversion receiver is used. That is direct from RF to audio. It can be selected at any time by the function switch and appears to be most effective. An internal preset trimmer allows the master 5 MHz oscillator to set spot on with WWV.

Perhaps one question that will come up is, what is it like tuning in 100 Hz steps? Is it possible to get an SSB signal spot on? The answer is a definite yes — even a fussy operator when it comes to getting the pitch right will be quite satisfied. Nevertheless, the ASTRO does include a FINE and an RIT control but as both of these only has a range of ± 50 Hz it seemed perhaps a waste of time to include them.

Most of the transmit tests were carried out on the twenty and eighty metre bands. Using a fair degree of the RF compression all DX contacts reported on the excellent audio. At the time of the tests, conditions were only fair, perhaps the best time to check transmit readability.

Power output was right up to specification with the built-in power meter agreeing with my usual station RF watt meter. In short, 100 watts on all bands from 80 to 15 and 90 watts on 10 metres.

SUMMING IT UP

Just where does a transceiver like the ASTRO fit into the scheme of things? There is no doubt that it would be an ideal mobile unit and also an ultra compact home station with a suitable power supply. Why, then, is it still largely unknown? I am sure that if amateurs could see one in action they would find it hard to resist, even at the rather high price they are selling for. Perhaps in relation to the advanced technology tied up in that small box, the price is not high at all. But maybe at this point some criticism could be stated. Unfortunately, the overall appearance and external finish does not match the price. There is no doubt that this is the point where most manufacturers throughout the world fall short of their Japanese competitors. Perhaps a little more time spent on good industrial design might have paid off with the ASTRO. I am sure though that in time we will see many of its features incorporated in amateur transceivers.

The instruction book supplied is well produced, but as is usual these days, does not include much information for the home repairer. A complete circuit running to nine pages is provided but no circuit board layouts are provided. A letter from Peter Schultz states the following. The Warranty is for 90 days from the date of purchase for faulty workmanship and parts except power output transistors. However, they are protected in the usual manner — read user's manual. Please also note this is a highly sophisticated transceiver. I do have service facilities for complete alignment,

but at the moment changeover boards available if major faults occur, supplied by the manufacturer.

Further details on the ASTRO 200 can be obtained from the agent, Sideband Electronics Sales, 24 Kurri Street, Loftus, NSW 2232.

Specifications ex March 1977 AR. ■

CLOSE FEDERAL LOOK AT CB

CLOSE FEDERAL LOOK AT CB

The following is a direct copy of a story published in the Townsville Daily Bulletin on May 24, 1978.

Further details on the Ministerial statement are at present unavailable.

The Federal Government is looking closely at the "problems" and "absurdities" of CB radio.

The Post and Telecommunications Minister, Mr. A. A. Staley, said this in Townsville yesterday.

A questioner had said that "everyone has CB radio, and we are told that in 1982 CB radio as such will cease to exist". Would there be a problem in regard to changing the law?

Mr. Staley said it was unreal to think that in 1982 the hundreds of thousands of people with CB radios would suddenly find it was illegal to operate them.

"You would need a policeman in every street, and even then they wouldn't catch them," he said.

Mr. Staley said the policy on introduction of CB radio in Australia had been well intentioned, but the "difficulties it would lead to" had not been foreseen.

He said he was trying to produce a new set of regulations governing the use of CB, "and we are looking at that 1982 date".

"CB has great advantages for certain people in certain areas, such as people on the land, or living outside cities," Mr. Staley said.

"It's a toy for some in the cities, a plaything.

"But it causes no end of interference to pre-existing services such as TV."

Mr. Staley said it was an "absurd situation" where you can sell a set which you cannot licence.

"I want something done about that," he said.

"You can import sets which you cannot licence. This is madness again. It only introduces a state of lawlessness.

"CB is here to stay, but we have to have sensible regulations so that the life we all lead can be made a little more comfortable and contented," he said. ■

IMPROVING THE ATLAS 210X TRANSCEIVER

L J Brennan VK4XJ
12 Cornhill St., Kenmore 4069

The Atlas 210X must be one of the best mobile transceivers on the market today due to its small size, light weight, and solid state final. It covers five HF bands with an output of around 80 watts and operates directly from a 12 volt supply. However, it does have some limitations and the following notes may be of interest to other users.

SENSITIVITY

Although the specifications for the Atlas 210X state sensitivity to be better than 0.4 microvolts for a 10 dB signal-plus-noise to noise ratio from 80 to 20 metres, about 0.4 uV on 15 metres and 0.6 uV on 10 metres, the set under test did not meet this specification on 10 and 15 metres. In comparison with another older valve transceiver it did not show up very well on these bands, so the problem was taken up with the manufacturer.

The Customer Service Manager suggested peaking the receiver input coils, making sure the VFO injection voltage was at least 0.4 volt, and if the sensitivity was still down, that a pre-amplifier would be found helpful, especially on 10 metres.

RF PRE-AMPLIFIER

No RF stage is used in the Atlas ahead of the mixer stage and a pre-amplifier will be found to be a worthwhile modification. The circuit suggested by Atlas is shown in Fig 1. It uses a 2N3866 and really improves the sensitivity of this transceiver especially on 10 metres. The sensitivity on this band is now around 0.3 uV for 10 dB signal plus noise to noise ratio. The extra gain also improves the operation of the AGC system which now works in a much more satisfactory manner.

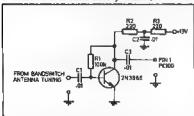
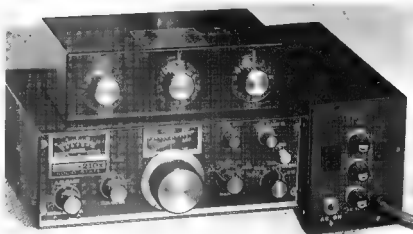


FIG. 1: Pre-amplifier.

The pre-amp was made on a small PCB by VK4UA and is about 2 inches long by 1 inch high. It could be made on a strip of Veroboard. It will fit the area of the



ATU and AC Supply.

Atlas PCB No 900, mounted at the top rear and using the two holes in this board to mount two 3/8 inch long stand-offs. The pre-amp fits neatly in place at the rear side of the dial drum.

The pre-amp is connected into the circuit by mini-coax between the band change switch for the antenna tuning circuit and pin 1 of socket for PCB No PC100. Plus 13 volts is taken from pin 10 of the socket for PC100. The ground connection is to the chassis nearby.

Due to the increased RF gain a resistor of 2,700 ohms is connected between the RF gain control R5—10k ohms and R7 (470 ohms). The additional resistor is supported on a small tag-strip near the gain control. The circuit alteration is shown in Fig. 2.

It was also found desirable to reduce the range of the audio gain control by disconnecting the lead from pin 22 on PC 300C and connecting it to the moving arm of a 20k ohm tab pot connected between

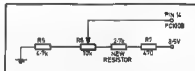


FIG. 2: Extra Resistor to reduce gain.

pin 22 and ground. The desired audio level can now be pre-set to give a better range for the audio gain control. See Fig. 3.

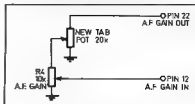


FIG. 3: New Tab Pot to reduce AF gain.

The gain was found to be too high on the lower frequencies. A pre-set mark about two thirds maximum permits adjustment for excessive RF gain and "S" meter readings on the lower frequency bands.

ANTENNA TUNER

The Atlas does not make provision for adjustment to various load impedances, and it will only deliver its maximum power when the load is between 50 and 53.5 ohms non-reactive.

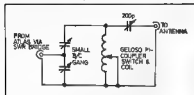


FIG. 4: Transmatch for Atlas.

Fig 4 shows a circuit of a transmatch that has proved very satisfactory, the inductance being a Geloso PI-Coupler, C1, a small two gang broadcast tuning capacitor and C2 any single gang around 200 pF. Two of these units have been built for the Atlas, one installed in the boot of the car. All knobs have numbered scales making it easy to pre-set the antenna tuner to any band. The unit in the boot of the car is a more compact version. An SWR bridge is used to adjust the tuner which is set up for minimum SWR. With helical whips mounted on the rear bumper there is only a short length of co-ax to the tuner in the boot. The tuner should be adjusted with the boot lid closed. Thus it takes some time to arrive at correct settings for all bands.

PORTABLE 240V AC POWER SUPPLY

The Atlas portable power supply was not available at the time of purchase, so one was made from locally available parts for a considerable saving in cost.

The circuit shown in Fig. 5 is similar to that in the Atlas handbook. Many other designs were considered but this one is simple to get going and can be made very compact, yet is adequate for the job of a portable AC power pack.

This supply fits into a home-made metal box 3 1/2 inches wide, 5 inches high and 9 inches long. On the front panel are mounted the three fuse holders, two DC outlet sockets, the mains switch, and mains lead into the supply. On the rear is the heat sink holding the 2N3055.

As with the Atlas supply the high current output is not regulated. A simple regulator is used for the low current circuits up to about 1 amp.

The two outlet sockets are a 6 pin Painton for the main supply with two pins in parallel for each circuit, the other a four pin Painton providing only the regulated 13 volts for other equipment (in this case for an IC502).

One transformer used is the Ferguson PF3788 which has two secondary windings each of 15 volts with a tap at 12 volt. Each winding is rated at 4 amps.

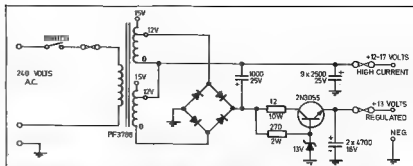
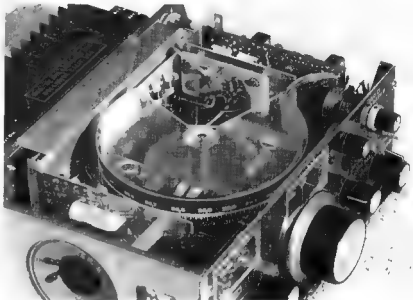


FIGURE 5: Power Supply.



View of RF Preamp installed.

The bridge rectifier is a PB40 rather than separate diodes. Nine 2500 microfarad capacitors were mounted on a plug-in Veroboard for the filter and the remaining parts were mounted on another piece of plug-in board.

The main high current circuit will supply about 10 to 12 amps at about 11 volts under CW conditions which has proved ample for portable use.

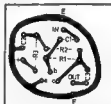
POWER SUPPLY LEADS

Several power supply leads have been made up to allow the Atlas to be used from various power supplies.

In all cases an automotive diode is connected across the plug in the reverse direction to take care of the Atlas should the connecting leads be connected to the wrong polarity. Another precaution has been to terminate all leads in a 4 pin connector and fit a suitable socket to the power supply source.

A small piece of aluminium bent into shape holds the two banana sockets and plug for connecting the Atlas.

Leads are used to operate the Atlas from a 12 volt 9 amp motorcycle



CHIRNSIDE ELECTRONICS

AT CHIRNSIDE WE'VE GOT IT ALL!!!

YAESU.

FT-901DM, 160-10M Transceiver.....	\$1499.
FT-101E, 160-10M Transceiver.....	\$849.
FT-301, 160-10M Transceiver.....	\$975.
FT-301S, 160-10M Transceiver, VOX Cal.-AM	\$725.
FT-301D, 160-10M Digital Transceiver.....	\$1075.
FT-7, 80-10M Transceiver.....	\$525.
FP-4, Matching Power Supply.....	\$63.
FRG-7, General Coverage Receiver.....	\$335.
FRG-7000, Digital General Coverage Receiver.....	\$659.
FT-227R, 2m, Mobile Transceiver.....	\$330.
FT-225RDM, 2M, ALL Mode Transceiver.....	\$POA.
FR-101D, Receiver.....	\$85.
FR-101DD, Digital Receiver.....	\$1050.
FL-2100B, 1200 Watt Linear Amplifier.....	\$530.
FL-101, 200 Watt DC Input Linear Amplifier.....	\$239.
YO-100, Monitorscope for FT-101E.....	\$279.
YO-101, Monitorscope for FT-101E, new model.....	\$368.
YO-301, Monitorscope for FT-301 series.....	\$369.
FP-301, Matching Power Supply for FT-301 series.....	\$178.
YP-301D, Digital Power Supply.....	\$288.
YP-150, Dummy Load-Watt Meter.....	\$108.
YD-844, Desk Mic.....	\$45.
QTR-24, 24 hr. World Clock.....	\$33.
FV-101, Matching VFO for FT-101E.....	\$149.
FV-301 Matching VFO for FT-301 Series.....	\$189.
FC-301 Antenna Coupler Inc. SWR and PWR Meters.....	\$220.
YC-500S, 500 Mhz. Frequency Counter.....	\$380.
YC-500J, 500 Mhz. Frequency Counter.....	\$319.
FL-101, Transmitter Companion unit for FR-101.....	\$675.
FTV-850B, 6M, Transverter.....	\$249.
FTV-250, 2M, Transverter.....	\$249.
R-301, Relay box for FT-301 to FL-2100B.....	\$23.
SP-101, Matching External Speakers for FT-101E.....	\$45.
FR-101, FRG-7, FT-301.....	\$45.
YC-601, Digital readout Adaptor for FT-101E.....	\$248.
YD-846, Hand mic.....	\$16.30.
FT-625D, 6M, ALL Mode Transceiver.....	\$TBA.
FT-225R, All Mode Transceiver, Analog Dial.....	\$POA.
Optional Crystal Filters.....	\$59.

HIDAKA.

Antennas.....	
VS-33, 3el. Triband Beam 20-15-10M, Inc. Balun.....	\$255.
VS-22, 3el. Duoband Beam 15-10M Inc. Balun.....	\$169.
VS-41-80KR, 80-10M Trapped Vertical.....	\$110.
VS-RG, Radial Kit for VS-41-KR.....	\$32.
VS-20CL, 3el. W.S. 20M Beam, Inc. Balun.....	\$199.

HY-GAIN.

2048A, 4el. 20M Beam.....	\$254.
TH6DX, 6el. Trap Beam.....	\$335.
TH3MK3, 3el. Trap Beam.....	\$299.
TH3JR, 3el. Trap beam.....	\$210.
HY-QUAD, 2el. Quad Beam.....	\$210.
Yaesu Gutter Mount Mobile Whips, Complete set 80-10M.....	
Inc. 2M.....	\$112.
Asahi AS-303, HF Mobile antenna set.....	
INC. ball mount and springs.....	\$135.
AS-NK Matching SS Bumper Mount for AS-303.....	\$20.

KENWOOD.

TS-520S, All Band Transceiver.....	\$POA.
TS-820S, HF Digital Transceiver.....	\$POA.
AT-200, Antenna Coupler.....	\$174.

MONITOR RECEIVERS.

MR-2, Mini Monitor 12 ch. Pocket receiver VHF.....	\$135.
MS-2 Mini Scanning Receiver 4ch. Inc.....	\$185.

CHIRNSIDE ELECTRONICS

26 EDWARDS RD.

LILYDALE 3140.

PHONE (03)726 7353

EMOTATOR.

Rotators still available from CHIRNSIDE ELECTRONICS

103LBX, Medium Duty. Suitable for VS-22.....	\$139.
502CXX, Heavy Duty. Suitable for VS-33.....	\$209.
1102MXX, Extra Heavy Duty.....	\$305.
1211 Mast Clamp for 103LBX.....	\$329.
1213 Mast Clamp for 502CXX.....	\$18.
1215 Mast Clamp for 1102-3MXX.....	\$45.
300 Mast Stay Bearing.....	\$30.
VCTF-7, 6 Core Cable, per Metre.....	\$1.15
VCTF-6, 6 Core Cable, per Metre.....	\$0.95.

ANTENNA COUPLERS.

HC-75, Tokyo Hy-Power Labs. Transmatch 75W PEP.....	\$72.
HC-250, Tokyo Hy-Power Labs. Transmatch 250W PEP.....	\$85.
HC-500, Tokyo Hy-Power Labs. Transmatch 500W PEP, Inc. 160M.....	\$112.
HC-2500, Tokyo Hy-Power Labs. Transmatch 2.5Kw. PEP.....	\$199.
AT-200, Kenwood, 200 Watts.....	\$174.
KW E-Zee Match.....	\$108.
FC-301, Yaesu, Inc. SWR and PWR Meters.....	\$220.

MORSE KEYS.

HK-707, On standard base with dust cover and knob.....	\$18.
HK-710, De Luxe heavy duty morse key.....	\$42.
TC-701, Practice keyer with built in Osc.....	\$18.
EKM-1A, Morse Practice Osc.....	\$14.

SWR.

SWR-200, Large dual meter SWR.....	\$70.
FS-600A, Peak Reading Wattmeter SWR Meter.....	\$73.
ME-11X, Twin SWR-PWR Meter, 3.5-150Mhz.....	\$18.
RS-101, Small single SWR Meter.....	\$9.75.
Western 5 Pos. Coax Switch.....	\$35.
Diawa 2 Pos. Coax Switch.....	\$21.
TWS-120, 2 Pos. Slide Coax Switch.....	\$15.
VS-1, Mini Mic. Compressor.....	\$22.50.
VS-5W, Ferrite Balun 2Kw. for Beams and Dipoles.....	\$25.
TV-42, Drake 3 Section Low Pass Filter, 1.5Kw.....	\$25.
Multi-band dipole traps and centre insulator 80-10M.....	\$35.
Porcelain Egg Insulators, each.....	\$0.50.
Wide Range of Coax Cable and Connectors in stock.	

VALVES.

6JS6C.....	\$10.50.
6KD6.....	\$12.50.
12GB7.....	\$9.50.
572B.....	\$52.00.
6146B.....	\$13.50.

Most YAESU Equipment Ex-Stock and on Display at all Times.

Pre-Sales checking is carried out on all equipment before despatch.

All equipment comes with proper English instruction manuals as supplied by factory, complete with 90 days warranty and spare parts back up.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Insurance 50 c per \$100. Please add sufficient for freight or postage, excess will be refunded.

CHIRNSIDE ELECTRONICS

APPOINTED YAESU AND
HIDAKA DISTRIBUTORS.

DIRECTOR: FRED SWART - VK3NBI



YAESU FT-7



NOW REDUCED TO ONLY
\$525.

RECEIVER

Sensitivity: 0.3 μ V for S/N 10 dB or better
Image Rejection: Better than 50 dB
IF Rejection: Better than 50 dB
Selectivity: -6 dB 2.4 kHz, -60 dB 4.0 kHz
Audio Output: 3 Watts @ 10% THD



YD-148
Desk Mic.
\$45.



FT-901DM 160-10M
\$1499.



Yaesu FT-225R. Digital 2M.

YP-150



\$108.

Dummy Load/Power Meter

Frequency Range: 1.8MHz - 200MHz
Impedance: 50 ohm unbalanced
Power Scale: 0-6 watts, 0-30 watts,
0-150 watts.
VSWR: Less than 1.2 at 145MHz
Maximum Error: Within 10% of
maximum scale.
Size: 104(W) x 153(H) x 280(D) mm.
Weight: 2 kg

HC-500A \$112.



Antenna Coupler.

Extremely important, especially with modern
all-solid state transceivers, is the
maintenance of a very low SWR to avoid
destruction of costly high-power PA
transistors. An antenna coupler enables
precise adjustment with almost any antenna



Morse Keys.
\$18.

EMOTATOR Rotators

103LBX Medium duty Rotator
502CXX Heavy duty Rotator
1102MXX Extra Heavy Duty Rotator
1215 Mast clamp for 1102MXX
1211 Mast clamp for 103LBX
1213 Mast clamp for 502CXX
300 Mast Bearing



QTR-24
\$32.



COUNTER-GENERATOR
\$208



**FT 227R FULLY SYNTHESIZED 2M
FM TRANSCEIVER**
\$335.



SWR-200 Large dual meter.
Full 2KW rating. Individually calibrated
to show power O/P. **\$70.**



FS-600A \$73.

Peak Reading Wattmeter SWR meter

MOST EQUIPMENT IN STOCK AND ON DISPLAY.

CHIRNSIDE ELECTRONICS 26 Edwards Road, Lilydale, 3140. Phone (03) 726 7353.

SHIRAZI ELECTRONICS IMPORTS, P.O. BOX 23 SINGAPORE, S.S.E. 2777, MUMBAI 76 CHAPMAN ROAD, PAULCONKING
TEL: 511394 (047) 51-1394 after hours (047) 54-1392

BY \$50,000.- order of HY-GAIN Antennas, the first ocean-freight shipment to leave the factory since the new management re-activated the plant, should have arrived by now. Meanwhile, while it was still in doubt whether anyone would take over, I have managed to construct a satisfactory minimum copy of the 204-44 entirely from locally available materials. I have also a design for a practical 40 meter Yagi. Anyone interested can ask for details how to make a 204-44 for \$125.-

This offer includes a Xerox copy of the 204-44 manual at cost for one dollar postage, copies of manuals of all other Hy-Gain antennas can also be made, they cost a dollar or so more for the 1b page ones.

As a further public service, copies of Ham Radio service bulletins can be supplied for a dollar each for the allotments etc. of the 28-420, 28-220/220S, 28-740, 28-700, and 28-220/220 30w power reduction conversions, plus 1/2 dollar handling fee.

A few more specials, No. 14 hard drawn copper antenna wire, new, luc net cut; one inch diam. 10mm insulation 50 (4m) coax cable, ideal for low-loss 43u pHE, 33.- per meter, net collect only, it cannot be rolled in less than 1.5 meter diameter!

HY-GAIN ANTENNAS:		
1V-4V/4W 10-15-20 vertical 23' tall	\$125.-	28-520 10-15-20 30w/3W transceiver 240V AC \$675.-
2V6-2V6 10-15-20 senior 3 el. Yagi 24' boom	\$300.-	28-420 10-15-20 30w/3W w/digital readout \$1,050.-
2V3-2V3 10-15-20 senior 3 el. Yagi 14' boom	\$240.-	28-5 10-15-20 digital display for the 28-520 \$175.-
2V3-2V3 10-15-20 junior 3 el. Yagi 12' boom	\$175.-	2V-400 60 transceiver \$200.-
2V4-2V4 20' 4 el. Tiger Yagi 26' boom	\$190.-	2V-502 20 transceiver \$235.-
2V-400 10-15-20 full size circular quad	\$260.-	2V-200 antenna matching \$165.-
1b 5 el. Yagi, reduce size slightly for 10w	\$70.-	2V-20 20-20 converter \$70.-
2 5 el. Yagi with balun 7'3" boom	\$75.-	2V-520 adaptor for 2V-5 to 28-520 use \$25.-
2 4 el. Yagi with balun 12'6" boom	\$80.-	28-700 20 all-mode transceiver \$750.-
28-420 balun, for beam biverc	\$20.-	28-300 low pass anti-VI filter \$30.-
		All other Ham Radio accessories shortly available,

YAGI'S FUSION FLOWERS:

PT-1012 10-1600 AC/DC w/speech processor	PLA
PT-9010 Deluxe AC/DC 10-1600 digital transceiver	PLA
PT-7 Mobile 10-1600 20W 12V AC transceiver	PLA
PL-2100B 10-1600 1200W Linear Amplifier	PLA
PRG-7 .5-30 MHz General coverage receiver	PLA

SPECIALS FOR NOVICE LICENSEES:

Transceivers for 10w coverage, V/USA, 15W PEP	
GTORANT 35-502 240V AC/12V DC 23 channels	
24,300-24,600 KHz, 540/400 meter	\$150.-
UNIVERSAL 224 12V DC 24 ch. 20,400-24,505 KHz	
in 577K steps Clarifier operates on receive	
& transmit giving virtually continuous	
crystal controlled operation	\$125.-
ATLAS 210X 10-1600 Mobile trans. w/10 cable	\$125.-
FOR MULTI-USE 16-24 ch. 10W 12V DC 24 trans.	
w/xtal for receivers 1-8 and ch. 40 & 50	\$175.-
ICOM IC-202 20 35W portable transceiver	\$175.-
2V-200 200 modified for latest circuitry	
including SWR/mismatch overload control	\$750.-

QUICK CONNECTIONS:

PL-250's - all types - in-line splices - each	75c
30-239 2 hole or single hole w/lock nut	each 75c
Double male connectors	50c
3 & 4-pin mic sockets, 3 & 4-pin in-line plugs	50c
3 circuit microphone jack	45c
2" x 2" coloured lenses w/crocodile clips - 5 for	\$3.-

WATSON'S:

Periscope/Field strength meter	\$15.-
SWR-SW 3.5-150MHz 10W Twin SWR/power meter	\$22.-
summer mounts with 3/8" 24 thread ant. mount	\$7.00
Outer mounts with 3/8" 24 thread ant. mount	\$4.50
5 metre lengths 28-520 w/PL-259 one end	\$3.-
3-ring body mounts	\$3.-
GLP right angle 28-520 to 30-239 w/lock nut	
& weatherproof cap	\$3.50
hls right angle 28-520 to PL-259	.90c

NOTES:

2V-400 20W azimuth rotator w/20W AC control box	\$100.-
2V-400 20W elevation rotator w/20W AC control box	\$125.-

All prices quoted are net, ex Singapore, cash with order, subject to change without prior notice. Be aware that the value of our dollar is going down all the time, except in exchange to the American dollar. Imports from Japan will continue to become dearer all the time, from 1/4/78 to 1/6/78 already close to 10%.

All risk insurance is free, freight by air, road, rail or post at cost, Comet/collect preferred. All orders cleared on a 24 hours basis after receipt with payment.

Axis dies (VX24V) Proprietor
Roy Lopez (VX24V) Manager

MODIFYING CB TRANSCEIVERS ONTO THE NEW 23-CHANNEL SYSTEM ON 10 METRES FOR ONLY \$24.00

Sam Voron VK2BVS

2 Griffith Avenue, East Roseville 3009

With the national adoption of a 23-channel system on the 10 metre band and the allocation of 28.1 to 28.6 MHz for novice amateur use, and with the cost of 23-channel AM transceivers dropping to \$40 and 23-channel SSB sets reaching \$130, many of our newly licensed amateurs are getting into amateur radio by modifying such inexpensive 11 metre gear onto 10 metres.

The versatility of many of these modified CB transceivers has contributed to the growing local usage of 10 metres in the areas of mobile, base, pedestrian hand-held and backpack radio operation on 28 MHz. This article describes how to modify a 23-channel Hygain V from 27 MHz to 28 MHz. This transceiver uses a circuit which is identical to the Midland 13-892, the Kraco 2365, the Kraco or Universe 2340, the Sideband Electronics SE502 and SE501. Just with 12 watts PEP and a 1/4 wave ground plane antenna contacts with an amateur in New York city and another in West Berlin were made soon after modifying the transceiver onto 28 MHz.

Operating the unit in a shoulder carrying bag which also contained a small 5 1/2 ampere hour sealed battery and a 4 1/2 foot helical antenna, the author has had hours of fun, walking around the streets of Sydney, working the 10 metre DX around Australia, waving to the passing CBers and saying hello to a few police officers. Help publicize amateur radio by operating out in the community. This article will help you get a portable HF DX station going.

As from the 1st January 1978 only 18-channel CB transceivers are licenceable for the citizens radio service. 23-channel unit licences can be renewed if they were licensed prior to that date and are in the possession of the original licence. As a result, a large number of 23-channel transceivers which are excellent for modification onto 10 metres, are available very cheaply in the "Wanted to Sell" section of the daily newspapers and in CB magazines.

CB transceivers employ three types of frequency generation. (1) The old method of two crystals per channel (one for receiving and one for transmitting). (2) The recently popular method of frequency synthesising, for which much information currently exists for modifying such units

onto 10 metres. (3) The increasingly popular phase-locked loop (PLL) system which offers exciting possibilities for 10 metre modification but for which currently I have not been able to obtain any details on modification of such systems onto 10m.

27 MHz transceivers using the frequency synthesised method of frequency generation can be modified onto the 23-channel system on 10 metres by locating the 10 synthesising crystals which are found in a bank of 4 and a bank of 6 crystals. A pair of crystals, one from each bank, is selected by the channel switch. This method allows generation of all 23 channels. Only one of these banks of 4 or 6 crystals need to be changed to modify such CB units onto 10 metres.

MODIFYING THE HYGAIN V ONTO 10 METRES

In the case of the Hygain V transceiver, the bank of 4 crystals in the 14 MHz range each have a series trimmer capacitor which would need to be readjusted if this bank were to be changed. It is therefore simpler to change the bank of six 23 MHz crystals. When changing the crystals in either bank for 10 metre use, this is easily calculated by adding 1.335 MHz to the existing crystal frequencies. This is obtained from the formula: Channel 1 on 10 metres (28.3 MHz) minus Channel 1 on 11 metres (26.965 MHz). The six new crystals required to cover the 23-channel 10 metre range for the Hygain V and similar transceivers are 24.665 MHz, 24.715 MHz, 24.765 MHz, 24.815 MHz, 24.865 MHz and 24.915 MHz.

All six crystals can be obtained for a total outlay of \$24 (U.S.), (\$4 per crystal, postage included) from Jan Crystals, 2400 Crystal Drive, Fort Myers, Florida, U.S.A. 33901. Simply state the make and model number of your transceiver and crystals will be made to the manufacturers own specifications, list the six crystals you

require and specify these as "CB synthesised crystals" to obtain this special price. Delivery is by airmail within 3 weeks. Customs duty and sales tax may be payable in addition.

Remove the old 6 crystals and note which crystal went in which socket, then solder in the 6 new crystals.

TUNING THE RECEIVER FROM 11 TO 10 METRES FOR AM AND USB OPERATION

1. Set the signal generator onto channel 13 (28.450 MHz).
2. With the switch on USB and a heterodyne note beating with the signal generator tune —
L18 the front end input RF amplifier coil
L19 the input coil to the mixer
L20 the mixer output coil
L202 the 38 MHz amplifier input coil
L203,
L204 the 38 MHz amplifier output coils.

Tune all coils for maximum S meter readings.

3. Check that each channel is operative, if the highest channel is not oscillating or if two channels are receiving a common frequency (an interesting overtone problem) then the solution in both cases is to slightly turn L201, the main 24 MHz overtone oscillator output coil.

Both USB and AM receive should be fully operative on 10 metres. The S meter circuit appears to be frequency sensitive and reads lower on 28 MHz even though the receiver does not lack any sensitivity. Adjust the trimpot RV9 for reasonable relative S meter readings.

TUNING THE RECEIVER FROM 11 TO 10 METRES FOR LSB OPERATION

1. Set the signal generator onto channel 13 (28.450 MHz).
2. With the switch on LSB and a heterodyne note beating with the signal generator tune —

L15 the 16 MHz amplifier input coil.

L16,

L17 the 16 MHz amplifier output coils.

Tune all coils for maximum S meter readings.

THE 23 CHANNEL SYSTEM ON 10 METRES

Channel Number	MHz	Channel Number	MHz
1	28.300	13	28.450
2	28.310	14	28.460
3	28.320	15	28.470
4	28.340	16	28.490
5	28.350	17	28.500
6	28.360	18	28.510
7	28.370	19	28.520
8	28.390	20	28.540
9	28.400	21	28.550
10	28.410	22	28.560
11	28.420	22A	28.570
12	28.440	23	28.590

TUNING THE TRANSMITTER FROM 11 INTO 10 METRES FOR USE AND AM OPERATION

1. Feed in the constant noise from a 2 metre FM receiver or a constant tone through the microphone of the Hygain V.
2. Set the switch to USB and channel selector to 13 (28.450 MHz) and tune:
 - L2 the output from the 27 MHz mixer
 - L3 the input from the 27 MHz preamplifier
 - L4 the input to the driver
 - L5 the input to the RF power amplifier
 - L6,
 - L7 the output from the RF power amplifier.

Tune all coils for maximum power output into a dummy load.

Both USB and AM transmit should be fully operative on 10 metres. Alignment is best carried out on USB rather than AM to achieve the 12 watt PEP level on SSB. Trim pot RV8, the SSB microphone gain control, can be adjusted fully if desired. On AM trim pot RV7, the AM microphone gain control, can be somewhat increased with the effect of improving the AM transmit audio quality.

TRANSMIT LSB OPERATION

This should be fully operative on 10 metres, if not, then using the same procedure as above, i.e. L15, L16 and L17 for maximum power output on LSB.

MODIFYING CB UNITS ONTO 10 METRES

As well as being frequency synthesised systems, check that coils are easy to tune before specially obtaining a CB unit for modification. The Hygain V and similar units are very easy to tune, as all coils are freely adjustable.

A GUIDE TO MODIFYING SOME OF THE 23-CHANNEL FREQUENCY SYNTHESISED TRANSCEIVERS FOR OPERATION ON THE 10 METRE BAND

Compiled with the help of VK2BK, VK2BZJ, VK2NDS, VK2NDX, VK2NEV, VK2NEJ, VK3AIH and VK4NBL.

AM ONLY

Units employing the frequency synthesised generation method:
Seiki, Midland, Realistic, Panther, Cobra, Fairmate. Existing crystals: 37.6, 37.65, 37.7, 37.75, 37.8, 37.85 MHz.

AM AND SSB

Units employing the frequency synthesised generation method:

(674B) Hygain V, Hy Range V, SE502, Kraco 2340, 2355, Midland 13-892, SE501 (these units have proved especially popular on 10 metres). Existing crystals: 23.330, 23.360, 23.430, 23.460, 23.530, 23.580 MHz. Zodiac Torus, Panther-Pearce Simpson. Existing crystals: 11.805, 11.855, 11.955, 12.002, 12.055 MHz.

Midland 13-893 and 13-895. Existing crystals: 11.0035, 11.0135, 11.0235, 11.0435 MHz.

Tram XL5 and Belcom S-8655. Existing crystals: 7.4625, 7.4725, 7.4825, 7.5025 MHz.

UT122E, Gemtronics 2325 and 3325, Scooper 9000. Existing crystals: 11.000, 11.050, 11.100, 11.150, 11.200, 11.250 MHz.

The new crystals for these popular units are obtainable by adding 1.335 MHz to the existing crystals. The outline on how to modify the Hygain V should be a guide to modifying some of the above units. The above guide comprises only a small number of the frequency synthesised units which may be modified for 10 metres, following the basic ideas outlined.

ADDING AN ADDITIONAL CHANNEL

Most 23-channel selector switches are able to provide an additional channel on a blank position, usually between channels 22 and 23. When connected, the channel is known as channel 22A — 28.570 MHz. With three additional connections, this can easily be obtained on the Hygain V and similar units. VK3NAU shows how this can be done on his Midland 13-892 in fig. 1.

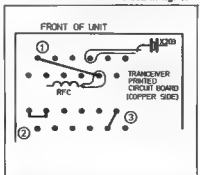


Fig. 1: Shows the three connections required between and within the six rows of crystal terminals on the copper side of the printed circuit board.

OPERATING ON 10 METRES

28.500 MHz is a popular listening channel in Sydney, Melbourne and Adelaide, with

28.550 MHz being monitored in Brisbane. Both these frequencies carry WIA broadcasts in various states. In Sydney 28.5 MHz is being used as an all mode calling channel. Contacts are established on USB, CW or AM and usually change to a lower channel to continue the contact. World-wide DX communications is normally carried out in the channels from 28.5 to 28.590 MHz.

OPERATING HAND-HELD OR BACK PACK PEDESTRIAN

Many of the 1 watt and 5 watt hand-held AM units are easily modified onto 10 metres. Some hand-held units are frequency synthesised and can thus cover all 23 channels (e.g. Realistic TC101 5 watt, 23-channel, hand-held) other units use the two crystals per channel system and can be fitted with 28.3, 28.4 and 28.5 MHz crystals which are available. Using such a hand-held on 11m AM when that band was available, I was able to contact a station in Perth just by calling CQ. Such 2000 mile contacts on low power AM will often be easy to experience on 10 metres during summer and mid-winter sporadic E periods. Operating the Hygain V as an over the shoulder hand-held or as a back pack pedestrian, portable can be achieved by obtaining a 5% ampere hour motor bike battery. These are light weight, only cost \$14, and will supply power for a long period before recharging is necessary. A visit to a camping or disposals store should locate for you a small carrying pack to hold the rig, battery and an 11m helical which can be shortened for use on 10m. 5 foot helicals can be shortened to 4½ feet and mounted as high up in the carrying pack as possible. Some 7 feet of wire can be used as the ground plane. Connect one end to the earth connection on the helical antenna mount and make one loop around your tummy. Twist this loop some 6 times and tighten the loop around your waist. Let excess wire hang down by your side. To experiment with the SWR, change the position of the helical in the carrying pack and vary the number of twists on the loop. An SWR of under 1.5 to 1 should be obtainable after a bit of experimenting. Carry an SWR meter in the pack so that SWR can be monitored occasionally whilst operating. Using this kind of set up whilst walking up to my local hamburger shop with my 10 metre portable, I have been able to have some very good contacts into Tasmania, Queensland and South Australia. My aim is to work all Australian States while walking pedestrian hand-held back pack both on SSB and AM.

VFO FOR 10 METRES

Modified CB transceivers offer an opportunity for a whole range of experimentation in modifications and additions. VK3AIH has been successful in designing a VFO for the units similar to the Hygain V which he hopes to describe in AR soon. Work is also progressing on a 160 metre transverter which can take advantage of the portable and mobile nature of modified CB equipment.

TO COMPLEMENT OUR USUAL RANGE OF CRYSTALS

BRIGHT STAR CRYSTALS PTY. LTD.

35 EILEEN ROAD, CLAYTON, VIC., 3168. Phone: 546-5076 (Area Code 03)

CAN SUPPLY A RANGE OF —



- OSCILLATORS
- WIDE-BAND AMPLIFIERS
- TTL & CMOS
DECADE COUNTERS
- ELECTRONIC CRYSTAL
OVENS

INTERSTATE AGENTS

Adelaide: ROGERS ELECTRONICS — Phone 42 6666

Brisbane: FRED HOE & SONS PTY LTD — Phone 47 4311

Perth: COMMUNICATION SYSTEMS — Phone 76 2566

Hobart: DIAMOND INSTRUMENTS — Phone 47 9077

All Mail to be addressed to: P.O. BOX 42, SPRINGVALE, 3171

Visiting Hong Kong

LET US ASSIST

WRITE FOR
INFORMATION

ALL BRANDS

HF

VHF

UHF

RECEIVERS

ACCESSORIES

Tel. K 36 0606 K 38 3774

DELTA COMMUNICATION SERVICES LTD.

15 CUMBERLAND ROAD,
KOWLOON-TONG, KOWLOON
HONG KONG

AMATEURS' PARADISE

BUY FROM QUEENSLAND'S STOCKIST

SEE OUR RANGE OF **KENWOOD GEAR** — TS520S, TS820S, DG5 Digital Readouts, DC Convertors, VFOs, Speakers. WHY WAIT? ALL IN STOCK.

VICOM AGENT for the GOLD COAST — check our ICOM equipment in stock.

SOLE DISTRIBUTORS for QLD. of the new **BEN LINEAR AMPLIFIERS** — Models for all bands — 70-120 watts — all the one price, \$159 — a beautiful unit.

Also **ROTATORS**, VHF and UHF Beams, all band **VERTICALS**, **BALUNS**, FT7s, FRG7s, FT101E **MORSE KEYS**, **WORLD MAPS**, **ZL CALL BOOKS**, **MIKES**, **CLOCKS**, **LP FILTERS**, **SWR METERS**, etc.

121 NERANG STREET, SOUTHPORT, QUEENSLAND 4215
(Opp Southport Hospital) Telephone: (075) 32 2644

Perfect CW is Automatic with TEN-TEC ULTRAMATIC KEYERS

(A) TEN-TEC KR50 Deluxe Dual-Memory, Dual-Paddle Keyer \$135.00

Here's the completely automatic electronic keyer you control. Fully adjustable to your own operating style and preference for speed, touch and weighting (ratio of length of dits and dahs to space between them). Dual memories individually defeatable, for operation as full sambic (squeeze) keyer, or with single memory, or as conventional keyer. Self-completing characters. User-adjusted fixed or automatic weighting (50-150%) controlled by speed setting. Adjustable paddle force (5-50 gms). Adjustable speed (6-50 wpm). 500 Hz side-tone oscillator. Built in "straight key" button. Operates on 240VAC, 50-60 Hz or 6-14 VDC.

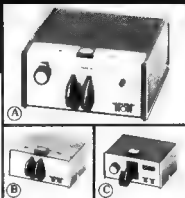
(B) TEN-TEC KR1-A Deluxe Dual Paddle \$45.00

Same package as KR50, for sambic or conventional keyers.

(C) TEN-TEC KR5-A Electronic Single-Paddle Keyer \$49.00

Factory adjusted actuation force for smooth keying, factory set weighting factor for smoothness and articulation. Self-completing characters. Adjustable speed (6-50 wpm) less side-tone and power supply. Operates on 6-14 VDC.

For Further Information on the Full Range
of Ten-Tec Equipment, Please Phone, Write or Call



Authorized Australian
Distributor for

TEN-TEC

graham e. stullord

27 WHITE AVE. LOCKLEYS 5032
SOUTH AUSTRALIA - PHONE 43 7981

10.7 MHz CRYSTAL FILTERS FOR FM SYNONYMOUS FOR QUALITY AND ADVANCED TECHNOLOGY



KVG

**MATCHING CRYSTAL
DISCRIMINATORS**
NBFM XO107.01
WBFM XO107.02
(19) \$22.10 each

EXPORT ENQUIRIES WELCOME

Oscillator Crystals 50 kHz through 150 MHz available to order. Parallel resonant (30 pF) to 20 MHz. Series resonant above 20 MHz. Write for quotation to your requirements (include mechanical size & frequency).

Filter Type	XF107 A	XF107 B	XF107 C	XF107 D	XF107 E	XF107 S04
Application	NBPM	NBPM	WBFM	WBFM	WBFM	NBPM
Number of Filter Crystals	8	8	8	8	8	4
Bandwidth	12.0 kHz	15.0 kHz	30.0 kHz	35.0 kHz	40.0 kHz	14.0 kHz
Pass Band Ripple	≤ 2 dB					≤ 1 dB
Insertion Loss	≤ 3.5 dB	3.5 dB	≤ 4.5 dB	4.5 dB	4.5 dB	7 dB
Input Output Termination	820 Ω	910 Ω	2000 Ω	2700 Ω	3000 Ω	910 Ω
Shape Factor	25 dB/2.4	20 dB/2.3	170 dB/2.2	170 dB/1.9	170 dB/2.0	40 dB/1.0
Ultimate Attenuation	90 dB/2.8	190 dB/2.9	190 dB/2.7	190 dB/2.5	190 dB/2.5	
Size	1 27/64" x 1 3/64" x 3/4" High					1 1/2" x 1 1/2" x 1 1/2"
Price 19	\$40.60					\$10.95



**SPECTRUM
INTERNATIONAL INC.**
Box 1084A Concord
Massachusetts 01742 USA

Shipping weights Filters 2 oz. ea. Crystals 1/2 oz. ea.
Registration Fee \$2.00 Air Mail 31c per 1/2 oz.
All Prices in U.S. Dollars

QRP

CB TALK

The loop at the bottom of a CB antenna makes it a "Ringo".

SWR is important for CB but doesn't matter for FM.

UHF sets are no good mobile but have farthest quality of speech on long contacts.

UHF is good and clear and will be good when the DX comes in.

From "The Lyrebird", No 3 issue

10m BEACON

Worldradio May 1978 includes a short article about a CW beacon on 28.68 MHz in North Hollywood, USA. Reception reports are requested to WJRT, 7712 Wilshire Avenue, North Hollywood, CA 91605 USA, as the licence for the beacon runs through to about November.

IARU R2 CONFERENCE

The IARU R2 international conference will be held in Panama from 3rd to 5th September 1978. IARU R2 comprises the Americas, Hawaii and near islands and the Caribbean area. An invitation to attend the conference was extended to the Secretary-General of the ITU and he hopes to attend.

USA ISLANDS — PREFIX CHANGES

From 24th March 1978, according to Ham Radio May 1978 the "new" call sign structure in the USA has been overhauled (amateurs moving from one call sign area in the US can retain their old call sign prefix) and this includes new prefixes as follows: K1* Canton KH2 Guam KH3 Johnston KH4 Midway KH5 Kingman KH6 Palmyra, KH6 Hawaii KH7 Kure, KH8 Samoa, KH9 Wake KP* Navassa, KP2 Virgin Islands, KP3 Serrana Bank, KP4 Puerto Rico.

DELAYED BRAKING ACTION FOR ROTATORS

Geoff Wilson VK3AMK
7 Norman Ave., Frankston 3199

In AR, May 1977, p. 18, in the "Commercial Kinks" section there was a very interesting circuit from P29KE showing how to modify the control unit of the Ham II rotator to delay application of the brake until the motor (and of course, the antenna) had stopped turning. As there was very little detail given at the time and this seems to be a very important subject, the following expands on the original article.

The Ham II control unit does not have separate brake and left turn/right turn controls but as supplied it is still very easy to operate these out of sequence when stopping the rotator and as a result damage can occur to either the rotator, tower or both. Most manuals supplied with large beams and rotators go to great lengths to stress the need to take precautions when a large beam is suddenly stopped. Although the speed of rotation may only be about one r.p.m., the momentum is quite large and for this reason it is desirable to let the motor slow right down before releasing the brake solenoid. The P29KE circuit does this by using a capacitor and relay with a time constant of about two seconds connected across the brake release switch. The capacitor is charged via diodes from the clockwise and counter clockwise control switches and discharges through the relay coil. When the relay coil discharges the capacitor, the relay contacts open and the brake is applied.

Having used a number of rotators with very long antennas the worth of the modifications was immediately apparent. After trying the circuit several points arose: (a) There is an error in the circuit as given, pin 1 as shown is actually pin 8, pin 1 is connected to earth; (b) Relays other than the type quoted may be used as long as the capacitor is altered in value to give a time constant of about one and a half to two seconds. I used a 7.6k ohm type with 100 uF across it but any combination that works will do, e.g. a 12 volt type may be used with series resistor etc.; (c) There was no provision for over-riding the delay circuit. This arises when turning the antenna into a strong wind and no delay is required as the antenna may then even be forced backwards by the wind. This was overcome by using a normally closed push button switch in the relay circuit. When an undeveloped stop is required the button is pressed; (d) Visual indication of brake release. Another minor modification, but well worth the effort, a LED, resistor and diode wired across pins 1 and 2 shows when power is applied to the brake release and the antenna is free to rotate. For these modifications refer to Figure 1.

Having tackled the Ham II control unit, I then tried similar techniques on another popular rotator, the Emotor Model 1100M. This was the earlier version, not the current series now being sold here. The existing circuit (as with the Ham II) was left intact and the circuit shown in Figure 2 added to produce the same effects as with the Ham II.

The only external changes to the control units were the addition in each case of a LED with mounting clip and a miniature push button switch. These were mounted as follows: Ham II — directly above each other over the words "Brake Release" on the front panel; Emotor — switch be-

tween "Left" switch and "On/Off" switch, LED between "On/Off" switch and "Right" switch. In each case sufficient space is available within the control unit for the additional components to be placed without crowding. The 56 ohm resistor shown in Figure 2 is essential, without this the "Left" and "Right" indicator lamps will flash brightly with switching surges and may even burn out. Note also the secondary voltages of the two transformers involved are 30 volts in the Ham II and 100 volts in the Emotor. Before cutting any holes in the panels firstly remove carefully the meter from each control unit and protect the transformers from flying steel chips which will result from any drilling. ■

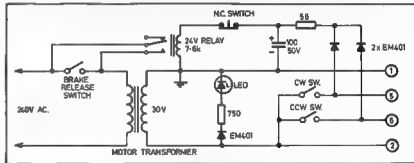


FIGURE 1: Ham II Circuit.

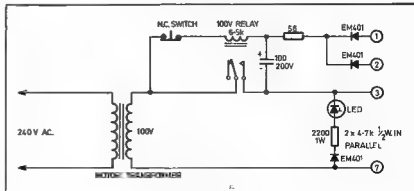


FIGURE 2: Emotor Circuit.

VIDEO GUNNPLEXER SYSTEM

Bob Cooper W5KHT

The fascination of amateur microwave application is unique. First of all, microwave systems have an exotic ring to them. Until the appearance of the Gunnplexer, getting into microwaves required either a six foot rack of surplus gear or a friend on the inside of a microwave hardware supply company. The Gunnplexer has changed all of that; you can hold the whole blamed thing in the palm of your hand and you don't need any friends in the microwave business. In fact it may be better if you don't have any prior microwave knowledge because the Gunnplexer pretty much throws away the book on standard microwave design practices!

An equal fascination is the wide band capability of the microwave region. The 10 GHz assignment, for example, has spectrum-space for 111 simultaneous video (4.5 MHz wide) channels. Try that even using SSTV in the 20 metre assignment.

Another fascination is the "security" of the spectrum. It is not likely that people will "stumble across" your signal at 10,250 MHz and that means you can do things there (legally of course) which you would be ill-advised to attempt even at 440 MHz.

A fourth fascination is the challenge. For example, the Gunnplexer accessory horn antenna has a nominal gain of 17 dB. Unbolt the horn and replace it with a 2 foot surplus dish and you have just added another 16 dB of gain to your system. Put a two foot dish on both ends of the circuit and you have just added 32 dB of gain to the "system circuit". Do you know what 32 dB is? Run the 1 kW output of your rig down to 1.0 watt output. That's 30 dB.

Another way to look at the Gunnplexer system is to note that the nominal 20 milliwatt output power is around 17 dB below 1 watt. If the horn antenna has 17 dB of gain, the Gunnplexer has the rough equivalent of 1 watt into a 0 dB gain antenna. With that much established, if you run your 1 watt equivalent power into an antenna that has 16 dB of gain (a two foot dish at 10 GHz has "horn gain plus 16 dB" or approximately 32 dB), what you really have is the equivalent of your one watt two metre hand-held loading a 16 dB gain antenna. Not a bad system. It will certainly "talk" several miles, reliably.

The bottom line on microwave is simply that it will do much more communicating

than you might first suspect; it is so wide band that you can shove video or data or lots of voice through it simultaneously, and thanks to the Gunnplexer, you can hold it in the palm of your hand.

Although I operate on 439.25 MHz with ATV system and therefore am not new to a reasonably state-of-the-art fast scan ATV, the thrill of ATV at 10 GHz is almost undecipherable. First of all, with the system described here there is the "FM advantage", which means that you have the extra system gain that FM modulation adds.

Next there are the really rock solid and noise free signals. With FM, while it is possible to have signals with some hint of noise (or snow in video) on them, between the point where there is sufficient signal voltage to drive the system into limiting, and the point where you have no signal at all, there is typically a fairly narrow "dB" range. In the real world you typically have lots of signal or no signal at all.

THE MARK II SYSTEM

The system described here is a Mark II version of the first attempt at getting video through the Gunnplexers. The first system proved it could be done, for very little cost, but the range left a great deal to be desired.

To get good range you need a high gain, low noise IF and considerable stability. The first W5KHT package selected a rather high IF of approximately 260 MHz where a pair of 180-degree-out-of-phase coaxial lines (1/4 wave and 3/4 wave) were utilized for the discriminator. The system worked but suffered from a very high noise figure; created by a CATV type hybrid chip amp selected for the IF amplifier. So back to the drawing boards.

The system shown here uses a 41.25-45.75 MHz IF. The reasons are simple enough; this is in the TV receiver IF range and circuits as well as relatively low cost components are readily available. Plus, by selecting an IF in this relatively low VHF range it is possible, using the J310 FET to realise IF system noise figures in the under 3 dB region.

The transmitter modulator is about as simple as it is possible to conceive. The 1 volt peak to peak video signal is applied directly to the +1/+20 volt port on the Gunnplexer. A 500 ohm pot allows you to vary the modulating video signal voltage to prevent saturation. A 10K pot in the +8 volt Gunnplexer supply line allows you to walk the transmit frequency into the IF of the receiver. Ideally the walking should be on the receive end but that presents a new set of problems.

For those concerned about frequency stability, it has been our experience to date that for casual use you should not worry too much. At least not so much that it keeps you from getting on the air. The wideband video signal can move around quite a bit and still stay within the pass-band of the receiver. Remember that the stability is on the order of 350 kHz per degree C change; that if both units are in the same type of environment (i.e. both outdoors) then what affects one will affect the other as well. A pair have been run continuously for as long as 72 hours without touching the frequency walk control on the transmitter. For a sophisticated system that will run full time with 100 per cent reliability, some form of AFC is mandatory of course.

The simple modulator has been tested with various types of video sources for resolution and linearity. A 250-350 line camera will look as good through the system shown as it will directly through a local video loop system. There is some measurable phase change on a 4.2 MHz wide commercial signal (around 15-20 degrees) but it is not obvious to the eye if you run a colour video signal (such as you might borrow out of a colour TV set or from a VCR/BTR video output) through the modulator, Gunnplexer system and demodulator back into a colour monitor. To operate the transmitter, simply follow normal Gunnplexer set up instructions, connect a 1 volt peak to peak (max) video signal to the input coax connector and using the companion Gunnplexer receiver adjust the frequency control and the video level control (in that order) for best picture. If you happen to have a 4.5 MHz composite signal source handy (where the TV audio is modulating a 4.5 MHz oscillator that is mixed with the "raw" video signal) you can feed the composite (video plus audio) signal into the Gunnplexer as well. Keep the aural sub-carrier down

THE RECEIVER DEMOD

There are five stages of 41.25-45.75 MHz IF starting with the first J310 FET and running through an SD1006 and three 2N3563 stages. "Tip to tip" HP 2600 diodes form a limiter, followed by another pair in a wide band discriminator. The discriminator approach shown was selected because of the bandwidth involved; you don't want to frequency limit in the discriminator after going to this much trouble to get video through the package.

Following this are two stages of video amplification; another J310 and an output 2N3563 stage.

There are two warnings for the builder:

- (1) Unless you have access to a sweep generator, with markers, there is almost no way to align the five stage high gain IF properly. When you get

all done you will have in excess of 45 dB of IF gain here (48-52 typically) and it needs to be flat within 0.5 to 1.0 dB across the IF bandwidth. If you don't care about composite audio (4.5 MHz separated from the video) you could narrow the IF bandwidth to around 3.0 to 3.2 MHz and pick up a few dB more gain. But don't try to run colour through a narrow bandwidth; it will smear and "ring" on you.

- (2) Because of the relatively high gain and tight packaging, RF feedback can be a problem. The answer is good bypassing of power leads, always short RF leads, and don't mount the two boards (if that is the way you elect to go) so their RF parts face one another, i.e. put the copper of a board between the two open IF circuits.

Finally, note the two shields shown on the schematic. Don't neglect them.

Alignment follows TV IF textbook alignment procedures. When you have the gain in the right range and the bandpass between 3.0 MHz (for low resolution black and white cameras) to 4.5 MHz (+) (for colour or composite) the 500 ohm pot in the "alt" end of the discriminator circuit is adjusted for best drive level to the J510 video amplifier. You almost have to do this (once, then forget it) with the Gunnplexer video transmitter as a source, at close range (where the signal level/drive is high).

Just as you connected a video source (vidicon camera, test signal source such

as a set of colour bars or a transparency via a flying spot scanner, out from a TV receiver detector, etc.) to the transmitter. Gumplexer, at the receiver you come out of the last video gain stage through the coaxial fitting to a video monitor if you are passing composite video/audio, you will have to locate a second (4.5 MHz) discriminator here to recover audio as well. Or you could feed a TV channel "modulator" (RF signal source that will accept a composite input) to tune in your received signal on a standard TV receiver.

The 17 dB gain horn antennas are small, simple to use, and fun to play with. For line of sight paths of a few miles, they work just fine. The commercial people who insist on 99.97 per cent reliability *have* to see 40 dB signal excesses at the full limiting point or they are not happy. For amateur application, anything that is into limiting is adequate and should be noise free.

But for serious work you will want to graduate to surplus 2, 4, 6 or 8 foot dishes. Just remember how much more gain you get with a 2 foot dish (typically 16 dB more gain per antenna or 32 dB circuit gain) over the 17 dB gain horn antennas. By the time you get to 8 foot dishes on both ends you have picked up around another 8 dB circuit gain per antenna or 16 dB total path gain. That's a bunch.

But whereas the horn can be considerably off heading (the 3 dB beamwidth is broad enough that 10-15 degrees off doesn't make much difference) by the time you reach an 8 foot dish you are looking at 3 dB beamwidths on the nature of a degree or so. That makes finding the other guy a little tougher than with a horn. But the trade off is worth the effort if long hauls are your interest.

There are a few warnings concerning surplus dishes:

- (1) The Gunnplexer has a "WR-90" flange (where the 17 dB horn bolts on). Common antenna feed fittings can be either WR-90 or WR-75 and they are not directly interchangeable.
- (2) If the surplus dish you spot is not round, but elliptical and it has a shallow concave shape . . . it is not a parabolic at all. It is a passive reflector. They are cheap, and *useless* for direct illumination for our purposes.

Perhaps the best trade for (1) transportability, (2) gain, and (3) ease of handling are two foot dishes. With the exact equipment described in these application note sheets I cover a 20.3 mile path (line of sight of course) with full reliability. At the moment this circuit is being utilized to feed an alternate remote video/audio source back to the W5KHT shack where after demodulation it is patched into the 439.25 MHz ATV rig. I wouldn't guarantee it would stay reliable in a heavy rainstorm but then I'm not Ma Bell either!

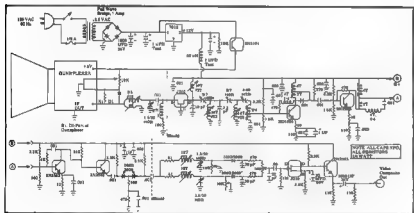


FIGURE 1: Video/Composite Demodulator.

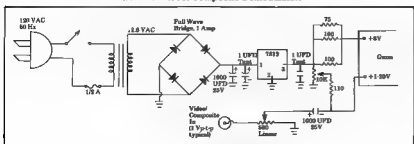


FIGURE 2: Composite Demodulator.



electronics

Head Office, Sales & Service: 23 JUDGE ST., RANDWICK NSW. Ph. 300 6370
City Branch: ROOM 200/061 GEORGE ST., SYDNEY 2000. Ph. 212 4915
Cable Address: EMONA Sydney. A.N. CALL 390 6376

MAIL ORDERS: Box K21, Haymarket
NSW, 2000, Australia
WRITE, PHONE OR CALL IN!

!SPECIAL ANNOUNCEMENT — NEW RELEASE!

DON'T WASTE YOUR MONEY ON TRANSCEIVERS WITH HIGHLY INFLATED
PRICES CURRENTLY AVAILABLE ON THE AUSTRALIAN MARKET!

SAVE UP TO \$400 WITH THE NEW DIGITAL

Dentron DTR-1 H.F. TRANSCEIVER

INTRODUCTORY PRICE
AVAILABLE IN SEPT. 1978

\$725.00

- All American Design and Components
- 160-10 Metres, full coverage standard
- Digital Readout, standard
- All Solid State Design
- Plug-in PC Boards throughout
- No-Shutdown Final Amplifier works into any load
- 2.1 kHz 8 pole SSB Filter 9 MHz IF, standard
- 500 Hz and 1 kHz active audio filters for CW, standard.
- RIT, 10 kHz overall bandwidth, 5 kHz of centre frequency.

- VOX, standard with front panel switchable PTT
- 25 kHz calibrator, standard
- Noise Blanker
- Semi-break-in CW with sidetone oscillator, standard
- Separate speakers in DTR-1 and matching DTR-1-AC power supply
- 250 Watts SSB CW

LINEAR AMPLIFIERS:

DENTRON RADIO CO.: MLA-2500, 160-10m linear amplifier

DENTRON RADIO CO.: MLA-1200, 80-10m linear amplifier.

DENTRON BIG DUMMY LOAD: 2kW — \$39.00.

ANTENNA TUNERS — DENTRON 80-10AT \$84.00,
DENTRON MT-3000A \$447.00.
DENTRON 160-10AT \$186.00.

The MT-2000A

The Dentron MT 2000A antenna tuner, an economical full power tuner designed to handle virtually any type of antenna, whether it be a vertical, beam, quad, dipole or long wire. The sleek, styling and low profile of the MT 2000A is certainly beautiful, but be assured that isn't all you're buying. The MT-2000A is designed and engineered using heavy duty all-metal casework and high quality American components throughout. When you consider the MT 2000A's unique features — front panel coax bypass switching, front panel lighting protection antenna grounding switch, 3 kW PEP handling capability and built-in 3 core balun for balanced feed line — we're sure you'll decide to buy American and stay with Dentron.



\$1300.00



\$269.50

DENTRON MLA-2500

Dentron Radio has packed all the features a linear amplifier should have into their new MLA-2500. Any Ham who works 1 can tell you the MLA-2500 really was built to make amateur radio more fun.

Dentron ANTENNAS:

ALL BAND DOUBLET

\$39.00

- WRITE OR CALL FOR SPECIFICATIONS
- CHECK OUR MOST SENSIBLE PRICES.

WE ARE AUSTRALIA-WIDE
DISTRIBUTORS OF

Dentron
PRODUCTS



The Jr. MONITOR \$103.50

Call it what you will — antenna tuner, transmatch, matchbox, or matching network, the JR MONITOR has it all wrapped up in one neat 5 1/2 in. w x 2 1/2 in. h x 6 in. d all metal cabinet. Think of the unlimited possibilities you have for experimenting with dozens of antennas. For instance the Dentron All Band Doubler fed with balanced feed line hooked to the JR MONITOR covers 1.8-30 MHz — or try this mobile suggestion: 100 in. mobile whip fed with coax to the JR MONITOR located under the dash will give you 10-40 metre mobile coverage and no coils to change! Order Today.

AMATEUR PRODUCTS DEALERSHIPS FOR MANY AREAS ARE AVAILABLE!!!



EMONA electronics

Head Office, Sales & Service: 23 JUDGE ST., RANDWICK 2031. Ph. 398 6378
City Branch: ROOM 200/661 GEORGE ST., SYDNEY 2000. Ph. 212 4815
Cable Address: EMONA Sydney. A.N. CALL 398 6378

MAIL ORDERS: Box K21, Haymarket NSW, 2000, Australia

WRITE, PHONE OR CALL IN!

FROM FDK OF JAPAN COMES THE LATEST MILITARY TECHNOLOGY AT AMATEUR PRICES, THE

Bigear VHF-UHF TRANSCEIVERS!

Type 1 —

2m FM SSB CW PLL SYNTHESIZED MOBILE BASE TRANSCEIVER \$694

- 144 - 148 MHz, PLL digital synthesizer system
- FM. 800 channels (5 kHz step)
- SSB. 400 channels (10 kHz step) plus VFO system (± 7 kHz)
- AC 117/240V, DC 13.8V, two-step power supply
- Digital display system (using a large-sized LED) provides reading up to s.x figures

Type 2 — 2m FM PLL SYNTHESIZED MOBILE TRANSCEIVER \$361

- 144 - 148 MHz, PLL digital synthesizer system (800 channels)
- A large-sized LED, digital display system provides readings up to six figures
- Easy-operating separate and selective mechanism displayed by the frequency unit for wider operation
- Transmitting output 25W/1W two-step selector switch



WRITE OR CALL FOR FURTHER SPECS!

FOR

MULTI Palm II NEW RELEASE!

2m FM POCKET TRANSCEIVER

SPECIFICATIONS:

Transceive Frequency Range 2 MHz In 144-148 MHz,
Transceive Channels 6 Channels Mode of Operation FM,
Antenna Impedance 50 Ohms unbalanced BNC connector
Power Requirement 12V DC (Negative Grounded),
Power Consumption on Transmit 300 mA, Receive 100 mA,
Stand-by 25 mA, Weight 1.03 lbs (470g) Repetitive Offset
 ± 600 kHz, Modulation Variable Reactance phase
modulation on Max Deviation ± 5 kHz, Microphone
Condenser Microphone Receiver Double conversion
superheterodyne (1st IF = 10.9 MHz, 2nd IF 455 kHz),
Sensitivity -4 dBm (IN 20 dB), Audio Output
Maximum 0.3 Watts, Attachment Rubber ducty
antenna Nicad battery pack, DC cable with
cigarette lighter plug, Carrying strap

\$199.90



FDK MULTI-800D

NEW RELEASE: Latest
Model with Up/Down

Frequency Tuning Controls on the Microphone — \$416

ANNOUNCING — FAMOUS MULTI 2700 \$744

FM/SSB/CW/AM, VFO/SYNTHESIZED TRANSCEIVER

Order Your ROBOT
Model 400 SSTV
CONVERTER NOW!



\$898

With the Robot 400 you just plug it into your transceiver, connect a TV monitor or your home set with the optional Robot RF adapter kit, tune to 14.230, and you're operating SSTV.

RELAX AND ENJOY CW — Go RTTY Emona's Silent Way!

NEW INFO-TECH MODEL 200!

A complete system that converts Morse, RTTY and ASCII to Video using Fairchild F-4 Microprocessor Technology! A good receiver and video monitor are all that is required! \$568

NEW INFO-TECH MODEL 300!

A Microprocessor controlled, stand alone, keyboard that generates Morse, RTTY and ASCII codes. \$364

NEW INFO-TECH RTTY EQUIPMENT:

Model 75 RTTY to Video Converter \$448
Model 150 RTTY Keyboard \$497



YAESU

FT101E Transceiver	\$839
FT301 Transceiver	\$930
FT301D Transceiver	\$1090
FP-301 AC Power Supply	\$165
FRG-7 Receiver	\$319
FL2100B Linear Amplifier	\$565
FV-101B External VFO	\$131
FTV-650 6-metre Transverter	\$249
YO-100 Monitor Scope	\$285
FV-301 External VFO	\$131
YO-301 Monitor Scope	\$335
YP-150 Dummy Load Watt Meter	\$99

KENWOOD
TS-520S Transceiver
TS-820 Transceiver
TS-820S Transceiver

P.O.A.
P.O.A.
P.O.A.

LUNAR

HF3-100L2 Linear Amplifier	\$248
8-Linear VHF Module	\$299
28-432 MHz Low Noise Pre-amplifier	\$42
In Line Switching 2m Pre-amplifier	\$85
Oscar Box "J" Dual Freq., Oscar 8 Down Converter	\$98.90

MIZUHO

SK-50 RF Pre-amplifier	\$84
SX-1 Pre-selector	\$83
DX555P Counter Generator	\$89
KX-1 Coupler	\$36
MX-10 Marker	\$29
Pre-scaler for DX-555P	\$38

ANTENNAS

Wilson — SY-1, 10-15-20m, 4 elem Beam	\$339
Wilson — SY-2, 10-15-20m, 3 elem Beam	\$279
Cushcraft — ATB-34, 10-15-20m 3el beam	\$289
Hustler — 4 8TV w/80m Resonator, Vert. Antenna	\$130

\$139

NEW:

Medium-Sized
Ham Antenna
Rotor — FU 400.
With approved
power supply.

Constructed for long trouble-free operation. 200 kg vertical weight capacity. Extra heavy duty disc brake that prevents wind-milling

MIDLAND ZONE CONVENTION

Graeme Stevens VK3ZSQ
Publicity Officer Midland Zone WIA Vic. D.V.

On Sunday, February 26th, over 120 amateurs, families, and enthusiasts attended the Midland Zone Division of the WIA's convention held at Strathfieldsaye.

The official dinner to be held on the Saturday night was cancelled when only three official registration slips were lodged by the due date. An "unofficial dinner" was held Saturday night when approximately 40 people turned up for the week-end.

On Sunday morning the trade displays totalling approximately \$45,000 were set up.

Fred Ball, as usual, was there, with a magnificent display of Yaesu equipment and accessories. Vicom also had a wide display with a lot of interest shown in the Singer Test Piece valued at a mere \$10,000; doubtless to say, everyone bought at least one. Sumner Electronics, agents for Ball, Vicom and Dick Smith, had something for everyone, including those hard-to-get 77 call books.

Local trade house Bruce Cutting Electronics put on a display of Akai home hi fi equipment and a very interesting VTR. This was borrowed by the Dick Smith display, who had a camera monitor set up taking film of all the displays for pro-

motional purposes, or was it for VK2ZIP who, unfortunately, wasn't there.

Moving on to the contests themselves, everyone had a load of fun.

Allan VK3BAY won the 2m Scramble, supposedly on Ch. 40, but a few QSY'd to 50. Ah well, everyone knew everyone after that, the whole idea of the game. Allan's prize was an aerial donated by Scalar.

Allan's YL, Bernie, a very nice and quiet person who had only used a microphone the day before, won the Unlicensed 2m Scramble. Well done, Bernie.

Frank VK2AKG from Sydney was awarded a prize for the longest distance travelled.

Rod VK3NCX and company won the 2m sniffer hunt and were awarded with a 2m power amplifier kit donated by Bendigo's Sumner Electronics. Now he's hoping Novices can come up on 2m along with many of the Z calls.

The XYLs came into their own next, with Joan, XYL of Graem VK3AGS, hitting the nail the most times, winning the nail driving competition.

Berrie VK3ACT was wandering around all day with a small trimmer and a paper clip type inductance soldered across it. Neville VK3ACN came out of the paint-

work and was closest to guessing the resonant frequency at approximately 19 MHz. (I still reckon it was in the Gigs, but - - -)

Trevor VK3YJT found the hidden 2m Tx and collected a multimeter for his effort.

Allan VK3AER was awarded a capacitor and a rather large choke (20H) to help him overcome his 50 cycle type deviation. For guessing the inductance of this choke, VK3NAD was awarded a calculator donated by Bruce Cutting Electronics, Bendigo.

The hammer throwing (all 22s were hidden) for the YL and XYLs nearly came to a sticky end when I was taking a photo of the arm action of Joan (XYL VK3AGS) and the hammer was thrown at me, I'll forgive you. Raelene Lukies was the eventual winner and will be our entrant for the Olympics.

The 2m fox hunt was won by Trevor VK3YJT and was rewarded with a SWR meter donated by Sumner Electronics.

The 160m Mobile Rally was won by VK3CV and Fred Ball donated the prize of a SWR meter.

The Midland Zone would like to thank all those people who participated in the week-end, especially the business house



Setting up for 2 Mx Sniffer Hunt



Ball Electronic Service with Fred and Assistants donated some Prizes



**2 Mx Sniffer Hunt —
VK3YJT with Hand-Held**



**Summer Electronics Display —
Donated some Prizes for Competitions**



**Bob VK3BO and Charlie VK3AUP and XYL's
soaking up Sun, Dinner, and?**



**160 Mx Vertical and 3 el. 2 Mx Beam for talk in Carol, XYL of
VK3APB, unloading some of 800 Hamburgers consumed**

who set up displays and donated prizes. A special mention for Bob VK3ZIM for the talk in, in which no one was lost, anyhow

Daphne, XYL of VK3XO, was hard pressed taking the registration money and did a splendid job.

Carol, wife of Max VK3APB, the Club president, and the rest of the XYLs and YLs who supplied the cakes and the cuppas, and turned it on for everyone really made it a good week-end for those

who attended.

Last but not least of all the Zone would like to thank Max VK3APB for all the work he did towards the running of the convention, storing the 400 odd hamburgers, etc., and attending to the BBQ, along with the secretary, Bill VK3FY.

MIDLAND ZONE WIA OFFICE-BEARERS

PRESIDENT: MAX VK3APB.

SECRETARY: BILL VK3FY.

TREASURER: BILL VK3XO.

MEETING PLACE: Club Rooms, Inglewood Street, Specimen Hill, Bendigo, 3rd Friday of the month.

ZONE REPEATER: Channel 4 VK3RAM, located Mt. Alexander.

ZONE NET. 2000 hrs Mondays. Channel 4 Repeater

ACTIVITIES: Lectures on AR every 2nd month. Possible AOCPP and Novice courses. Tours of interest on AR are conducted also.

CAPE YORK SSTV DX-PEDITION

Stan Mudford VK3BHZ
Georges Creek Roadside, Tallangatta 3700

On 30th September, 6WLs Reg, Les, Col, myself and son Steven set up camp on the Jardine River at Cape York, 600 miles north of Cairns. The three-day journey from Cairns had passed almost without incident despite the terrible pounding sustained by man and vehicle, the only mishap being the loss of the lid from the strawberry jam and the loss of refrigerant gas from the portable freezer, with the inevitable loss then of the rest of the meat supply. The purpose of the trip was to transmit the first ever SSTV video from the Cape.

During the setting up of our camp, we observed a thick pawl of smoke rising about 8 km to the south. Someone had been careless and started a bushfire. A decision was made to backburn the area on the southern side of the camp. This was achieved with help from a dozen or so other campers, and shortly afterwards the main fire reached the backburn area and subsided. Had we not taken this precaution, the fire would certainly have swept through the camp.

On Saturday morning a TH3JR triband beam with rotator was erected in a clearing some 30 metres from the operating tent. Reg and I then proceeded to string an 80m and 40m dipole between two trees. The wasps had other ideas but we eventually won.

The equipment in the shack consisted of FT101, Robot 400 scanconverter, homebrew keyboard, fast scan camera, 14 in. fast scan monitor with outrigger for the polaroid camera, and a power distribution panel with voltmeter and frequency meter. The power source was a 2.5 kVA petrol driven alternator placed as far from the camp as the extension leads would permit.

Zero hour, the engine was fuelled and on the first pull kicked into life. A quick check revealed that all the gear was operational. At 1030 the words "CQ DE DXPEDITION CAPE YORK VK3BHZ" were typed up on the video keyboard and sent to air on 20 metres beaming south. The CQ was answered by John VK3LM in Melbourne who gave a 5 + 9 report. Video sequences showing our camp site and the Jardine River were received closed circuit by John. This contact was followed shortly afterwards with Mick VK6TV in Kellerberrin with good exchange of video.

During the two day expedition much interest was shown by the other campers, and at times the shack was full with visitors. Some of their XYLS agreed to sit

in front of camera and have their picture recorded on cassette tape or transmitted to air. Video contacts were made with most VK States, ZL and JA.

The highlight being on the second day when I spoke to members of my family, who were on location at the VK3LM shack. We then posed in front of camera and were able to exchange good pictures of each other. Several polaroid pictures were made to record the occasion.

Technically, the expedition was a great success, with every piece of gear performing faultlessly (excepting the refrigerator). The low number of stations contacted was, however, disappointing. It was felt by the expedition members that the results achieved on the mission more than compensated for all the planning an effort. My special thanks go to John VK3LM who publicised the event and assisted in so many other ways.



Off air photo of re-transmission by VK6TV of Yamaha motor cycle at Jardine River on 1.10.77.



Stan VK3BHZ on Closed Circuit on location

NOVICE NOTES

ETCHING CIRCUIT BOARDS

Roy Hartkopf VK3AOH
24 Toolangi Road, Alphington 3078

It is more than ten years since the writer first began etching circuit boards at home. It is amazing that many amateurs are still afraid to do their own and even more amazing that some leading radio books still publish misleading and even completely incorrect information. There are three basic ingredients for etching circuit boards successfully at home. First the correct materials. Second the correct method and then the correct finishing. We will deal with these in turn.

MATERIALS

The materials required are absurdly simple. Things like temperature controlled baths, mechanical agitators and the like may be all very well for laboratories — though unless you mass produce boards they are hardly necessary even there. But all that you will need at home can probably be found in the kitchen. One ordinary plastic bucket. A square plastic basin or baby bath large enough to stand the bucket in and finally some steel wool or an eraser (India rubber). The etching material is ferric chloride. In most cases you will be able to get a saturated solution of ferric chloride already made up. If not, then simply dissolve ferric chloride crystals in water until no more will dissolve and store it in a plastic polythene bottle.

The method of marking out the circuit board will not be mentioned here except to say that the writer has found that by far the best resistant material is what is called silk screen printers' ink. This is not really an ink, but a kind of flat paint which dissolves in turpentine and will wash off very cleanly and easily when the board is etched. It can be thinned down with turpentine — it is normally of a creamy consistency — until it flows without running and can be applied to the board with a draftsman's ruling pen. With this method lines from 1/64 inch down to less than 1/64 inch can be cleanly and easily drawn. The ink dries in a few minutes and if a mistake is made the ink can be scraped off the board with a sharp knife and no residue remains to prevent the copper being etched.

The ferric chloride is not deadly dangerous. You can pick out a board from the etch provided you wash your hands thoroughly immediately afterwards, but it should be treated with the greatest care just the same. If you are working near a stainless steel sink, remember it will etch

and stain the steel. It will also cause your clothes to disintegrate in the same way that acid will. Treat it the way you would treat sulphuric acid — the acid used in automobile batteries.

METHOD

When the board is ready for etching, take the bottle of ferric chloride and carefully pour a small amount into the plastic bucket. I mean a small amount, just enough to cover the bottom of the bucket about 1/2 inch deep. Then half fill the plastic basin with hot water, the hotter the better, so long as it does not soften or melt the plastic bucket or the basin. Put the circuit board, copper side up, gently into the bucket in the etch. Don't drop it or you may get splashed. Then put a little hot water into the bucket so that the etch is diluted with about its own volume of water. Again the hotter the water, the better. If you wish you can add about a teaspoon full — a plastic one — of hydrochloric acid to the etch when you first put it in the bucket or alternatively after etching a couple of boards. It does help to keep the etch activated but the effect is not very great. Then letting the bucket rest, floating on the hot water in the basin, move it in such a way that the etch swirls round and washes over the circuit board which is laying copper side up in the bottom of the bucket. Use very much the same movement as you would when swirling the water round in a dish when panning for gold. There are two essentials for quick etching. The etch must be kept hot and it must move as quickly as possible over the surface of the copper. Using the method described you will begin to see the copper disappearing from the edges of the circuit board after a couple of minutes and after about five minutes or less the board will be completely etched. If you don't keep the etch swirling over the board it could take up to half an hour and you'll probably find the etch has soaked through the resist and the board is in a mess. But with the method described, you'll get a clean etch with even the finest lines with no undercutting and no marking of the remaining copper. A word of warning. Don't try to use Indian ink as a resist. It will probably wash off and ruin the board. Letraset can be used provided the copper surface is very clean and the Letraset is carefully burnished on. For large areas the copper can be covered with PVC adhesive tape.

If you follow the instructions about only using enough etch to just cover the board you will have no trouble in seeing when the board is etched. Take the bucket with the board in it outside and, lifting the board out, give it a good wash under the garden tap. Remove any PVC adhesive tape and rub both sides of the board to make sure all the etch is washed off. Then take the board and drop it into the plastic basin of hot water. Let it sit there for about five minutes while you put the bucket with the etch in some safe place where the baby and the cat can't get at it. There is no need to put the etch back into the bottle. If you cover the bucket with a piece

of plywood or heavy cardboard and leave it in a safe place in the toolshed you can get it and use it any time. After it has been sitting in a fresh basin of hot water, the small amount of etch will soon get hot enough without having to add any more hot water to the etch itself. The etch can be used several times depending on the size of the boards and the amount of copper removed. A sign that the etch is becoming used up is that it will change from a brown to a green colour and the time for etching a board will increase. Used etch, by the way, makes a very good weed (and plant) killer.

FINISH

When you have taken the board out of the basin of hot water and dried it on a cloth, you can easily wash the silk screen ink off with a rag soaked in turpentine. Wipe it clean and dry and then give it a good rub over with steel wool or an eraser until the whole of the copper surface is shiny. Then wipe it completely clean with a lint free cloth and paint it immediately with a solution of resin dissolved in methylated spirits.

Resin is the stuff used in resin cored solder, for putting on the bow of a violin and by gymnasts to prevent their hands and shoes from slipping when they are doing acrobatics. You can get it from art and hardware stores and it is quite cheap. When the methylated spirits dries out (it is best to leave it overnight in a warm place) the board remains coated with a first class soldering flux and will never tarnish. Special preparations for coating circuit boards are available — some of them spray on — which will do the same job. They are equally effective but expensive.

And that is all there is to etching circuit boards. It is so quick, simple and inexpensive that once you have tried it, you will wonder why you did not do it years ago. ■

COLOUR CODES FOR THREE CORE MAINS LEADS

The old colour code for three core mains leads was —

- Active — Red.
- Neutral — Black.
- Earth — Green.

A new colour code has been brought in with metric conversion and the adoption of new standards.

- Active — Brown
- Neutral — Light Blue.
- Earth — Green or Green/Yellow. ■

HELP WITH INTRUDER WATCHING

Sideband Electronics Sales

Distributors of COMMUNICATIONS TRANSCEIVERS

H. F. TRANSCEIVERS

TRIO KENWOOD	T.S. 820 S	P.O.A.
TRIO KENWOOD	T.S. 520 S	P.O.A.
TRIO KENWOOD	V.F.O. 820	\$185
TRIO KENWOOD	V.F.O. 520 S	\$150
TRIO KENWOOD	S. P. 820	\$ 65
TRIO KENWOOD	Pan Display B.S. 8	\$ 60
TRIO KENWOOD	Pan Display B.S. 5	\$ 60
TRIO KENWOOD	D.S. 1A	\$ 79
TRIO KENWOOD	Communication Receiver R. 820	T.B.A.
TRIO KENWOOD	A.T. 200	\$175
ANTENNA TUNER		
D. 5 Digital Display & Counter		\$185
TRIO KENWOOD	T.R. 7400 A	\$440
TRIO KENWOOD	P.S. - 8	
AC Power supply for T.R. 7400 A		\$166
TRIO KENWOOD	S.M. 220	\$319
Station Monitor Panoramic Adaptor optional		
TRIO KENWOOD Amplifier	T.L. 922 linear	T.B.A.

PLEASE WRITE FOR OUR VERY COMPETITIVE PRICES ON KENWOOD PRODUCTS. WE ALSO CARRY ALL SPARE PARTS FOR KENWOOD EQUIPMENT, BACKED BY FAST AND EFFICIENT SERVICING

FROM F. D. K.

Multy Palm hand held 2M FM transceiver 8 channel	
Nicad battery charger very attractive	\$199.90
F. D. K. Multy 2700	\$744
F. D. K. Multy 800 - D latest model with new type remote control mic.	\$416
F. D. K. type two 800 channels	
25 watts output	\$361

RTTY UNITS

DOVETRON MPC - 1000 - R - E	\$1,200
HAL ST - 5000	\$350
TELECODER: Similar to MPC 1000	\$700
TELECODER 500	\$300
INFOTECH Keyboard Mod 150	\$397.50
INFOTECH Vido Conv. Mod 75	\$448
TELECODER Kit also available	
TSR - 500 Complete 200 character UART FIFO Regenerator	\$250

Go RTTY with DOVETRON'S MPC - series multy path Diversity Terminal Units. The Rolls Royce of all terminal units. We are appointed distributors.

HAL ST 5000 - Economy terminal unit. 170-450-850 shifts

We have locally built units for lower prices.

SOON AVAILABLE SSTV with Robot 400 \$898

VIDIO DISPLAY UNITS

KEY BOARDS - Write for PRICE DETAILS

DENTRON DTR-1 250 WATTS P.E.P. ALL AMERICAN MADE. SOLID STATE H F TRANSCEIVER 160 - 10 METRES, DIGITAL DISPLAY AND STANDARD PLUG IN P.C. BOARD. CONSTRUCTION 2.1 KC 8 POLE FILTER, 9 M.H.Z. IF 50 C/S AND 1 - KHZ ACTIVE AUDIO FILTER, STANDARD 25 KHZ CALIBRATOR VOX NOISE BLANKER IS STANDARD.

WRITE FOR MORE INFORMATION
ALL THESE EXCITING FEATURES FOR ONLY

AC Power supply for above	\$125
DENTRON MLA - 2500 Linear Amplifier	\$1,300
DENTRON Antenna Tuners	
M.T. 3000A	\$447
M.T. 2000A	\$269.50
J.R. Monitor	\$103.50

H.F. ANTENNAS

HUSTLER 4 - BTV vertical trap ant, 10 - 80	\$130
WILSON: System one 4 element 3 band	\$339
WILSON: System two 3 element 3 band	\$279
HADAKA VS 40-80 Vertical	\$115
HADAKA VS 33 Tribender	\$265
HADAKA VS-22-3 Element 15-10 in balun	\$173
HADAKA VS-RG Radial kit for VS 41	\$33.50

SKY-BAND MOBILE HELICAL ANTENNAS

SKY 80 six feet long 3.5 MHz	\$ 28
SKY 40 six feet long 7.060	\$ 26
SKY 20 six feet long 14.150	\$ 26
SKY 15 six feet long 21.100	\$ 25
SKY 10 six feet long 28.500	\$ 24

ANTENNA ROTATORS

F.U. 400 All approved with external low voltage supp. Other types soon available \$139

YAESU MUSEN TRANSCEIVERS

PLEASE WRITE FOR VERY COMPETITIVE PRICES

CRYSTAL FILTER, 9MHz, similar to FT-200 ones. With carrier crystals. \$ 35

AUSTRALIA'S SOLE DIST. OF KLM PRODUCTS

KLM SOLID STATE POWER AMPLIFIERS

(MHz)	144-148 PA10 - 80BL	80 OUTPUT (watts)
"	PA10 - 140BL	140 "
"	PA 10 - 160BL	160 "
"	PA 2 - 70BL	70 "
"	PA 2 - 12B	12 Watts
400-470	PA10 - 70CL	70 "
	PA 2 - 25BL	25 Watts P.O.A.

New Shipment expected soon.

For personal attention: 24 KURRI STREET, LOFTUS
P.O. BOX 184, SUTHERLAND, 2232 TELEPHONE: 521-7573

SIDEBAND ELECTRONICS SALES

OPEN ON SATURDAYS TILL 12 NOON

PETER SCHULZ, VK2XJL

All prices quoted are net SYDNEY, N.S.W., on cash with order basis, sales tax included in all cases, but subject to changes without prior notice. ALL-RISK INSURANCE from now on free with all orders over \$100, small orders add 50c for insurance. Allow for freight, postage or carriage; excess remitted will be refunded.

WERNER ELECTRONIC

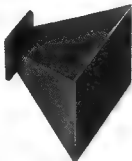
AUSTRALIAN AGENTS



Microwave Associates



MA-87127



MA-86551

The MA-87127 series of frequency modulated transceiver "front ends" using Gunn oscillators and Schottky mixer diodes has been specially designed to operate in the amateur 10.0 to 10.5 GHz band.

Three models available with or without antenna:

MA-87127-1	output 15 mW
MA-87127-2	output 25 mW
MA-87127-3	output 40 mW

**WERNER ELECTRONIC
Industries Pty. Ltd.**

28 GRAY STREET, KILKENNY, S.A. 5009
Telephone (08) 268 2766
Telex AA88405

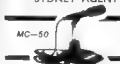
CUSTOM COMMUNICATIONS HAM RADIO SPECIALISTS



WE SELL

**KENWOOD
YAESU
DRAKE
ICOM
SWAN
ATLAS**

• AUSTRALIAN DISTRIBUTOR
• SYDNEY AGENT



MC-50

KENWOOD
Transceiver
RS-520S

HAM RADIO
SPECIALISTS
•
HF-VHF EQUIPMENT
•
RITTY UNITS
•
S.S.T.V.
•
NOVICE EQUIPMENT
•
ROTATORS
•
CB RADIO &
ACCESSORIES
•
WORKSHOP
• REPAIRS
• TEST EQUIPMENT
• Do it yourself workshop
•
PRODUCT TRAINING
& SERVICE
•
• WE TRADE IN AND
AUCTION EQUIPMENT

**OPEN 6 DAYS
BANKCARD
EASY FINANCE**



DRAKE TR-7

RITTY SYSTEMS
COMPLETE CONSISTS OF
PAGE PRINTER
TAPE REPERFORATOR
TAPE DISTRIBUTOR
DEMODULATOR
LOOP SUPPLY



SWAN CYN4ET model 300B

SPECIAL FEATURE
FREQUENT HAM AUCTIONS
PRODUCT N GHTS
FULLY EQUIPPED
DO IT YOURSELF
WORKSHOP



MAIL ORDER SERVICE
COUNTRY ENQUIRIES
WELCOME
ALL LETTERS ANSWERED



KENWOOD
599D
Series Receiver

USED TEST INSTRUMENTS
LEVEL METERS
OSCILLATORS ETC
VTVM
MORSE KEYS ELECTRONIC
KEYERS MATCHING NETWORK
HF AND VHF ANTENNAE



YAESU HF SSB
FT 101E thru 10M

TOP TRADE ON USED
HF EQUIPMENT

CUSTOM COMMUNICATIONS

6 ORCHARD LEIGH ST., VENNORA, N.S.W.

681 3544 AFTER HOURS
674 1719

bail



DOES YOUR ANTENNA TURN IN THE WIND?



DOES YOUR CONTROL UNIT
'CUT-OUT' AFTER ONLY A FEW REVOLUTIONS?

... then step-up to a RELIABLE EMOTO ROTOR.

Bail Electronics are pleased to announce ...

... an exciting range of ANTENNA ROTATORS
by EMOTO ANTENNA Co. of Japan



EMOTO FEATURES

- ROBUST DESIGN
- HEAVY DUTY STAINLESS HARDWARE
- 160v SUPPLY TO MOTOR REDUCES VOLTAGE/POWER-LOSS

COMPARISON OF ROTOR BRAKE TORQUE FIGURES (kg/cm)

Model	Torque
CD44	1,192
HAM-2	4,028
Emoto model 160 LBX	1,500
502 CXX	4,000
1102 MXX	10,000

We have been in the business long enough to know your requirements for a first class antenna rotor and we have gone "over-board" for the EMOTO range! There are many brands of antenna rotors, some of them complete y unsuitable for the majority of amateur applications, and for in a reason we do not stock them.

Most likely your present antenna rotor will turn your antenna and hold satisfactory, but it just will not hold it stationary under strong wind conditions. I.e. YOUR ROTATOR LACKS SUFFICIENT BRAKE TORQUE, the ability to hold the antenna still whilst a gale is blowing. HERE IS WHERE THE EMOTO SCORES. Take a close look at the comparison figures

above. Then compare the prices of all the rotors and you will have to agree that the EMOTO 103 LBX, EMOTO 502 CXX and EMOTO 1102 MXX are the best value. Finally, EMOTO ANTENNA CO., is not a new company. They have been making rotors for many years. Have no fears about this being a new and untried product!

Universal antenna couplers

Extremely important, especially with modern all-solid state transceivers, is the maintenance of a very low SWR to avoid destruction of costly high-power P.A. transistors. An antenna coupler enables precise adjustment with almost any antenna.



(SWR or CO-BAR)

HC 500A — 160-10m, up to 500w pep

(also available - not illustrated)

HC 2500 — 160-10m, up to 2.5kw pep

HC-75 — 80-10m, up to 75w pep

HC 250 — 80-10m, up to 200w pep

KW E-ZEE Match — 80-10m, up to 400w pep

FC 301 Yaesu — 160-10m, up to 500w pep

Our years of handling and specializing in this equipment have enabled us to build up a fund of knowledge and technical experience, backed by a comprehensive range of spare parts and service facilities. We don't just sell a set, our concern extends throughout the life of your equipment.

Now an addition
to YAESU'S range
of measuring instruments ...

QTR-24

24 hour
World
Clock



QTR-24

Yaesu has now made an addition to the range already well known range of measuring instruments. It is the QTR-24 a 24 hour World Clock. With a glance the time in any principal city or time zone can be simultaneously coordinated with local time on a 24 hour basis. The QTR-24 is powered by a 1.5V dry cell, which has a normal life of approximately one year. No amateur or SWL station could be complete without one.

Contact us for details of other Yaesu equipment plus the accessories required to complete your station.

All equipment from Bail's carries a 90-day warranty and complete service back-up.

JAS 7878-1

bail

ELECTRONIC SERVICES

FRED BAIL VK3YS
JIM BAIL VK3ABA

60 Shannon St., Box Hill North, Vic., 3129.
Ph. (03) 89 2213

Yaesu Agents in Australia since 1963

Radio amateur equipment from B.E.S. also sold by —

State	Radio Communication Services, H.R. PRODE 26 Lockhart St. Como 6132	Ph
W.A.	WALLIS TRADING CO. 428 Murray Street Perth 6000	Ph 450 4379
S.A.	FARMERS RADIO PTY LTD 20 Stanley St. Plympton 5038	Ph 293 2155
TAS.	G.T. ELECTRONICS 131 Westbury Rd. South Launceston 7200	Ph 44 4773
PRINCE EDWARD IS.	PRINCE RADIO 123 Argyle Street Hobart 7000	Ph 34 6912
N.S.W.	Avastar Tooling STEPHEN KUHLE 104 Robey St. Mascot 2020	Ph 667 1850
	Amateur & Novice Comm Supplies W.E. BRODIE 23 Dalrymple Street Seven Hills 2147	Ph 624 2691
	DIGITRONICS 186 Parry St. Newcastle West 2302	Ph 69 2040
Q.L.D.	RIVERCOM Sud Ward 3 Copland St. Waggga Wagga 2550	Ph 21 2125
	H.C. BAILLOW 82 Charles St. Ashburton Towers 16 4814	Ph 19 5179
	MITCHELL RADIO CO 59 Albion Rd. Albion 4010	Ph 57 6830
A.C.T.	QUICKTRONIC Jim Bland Shop 11 Altree Cr. Phillip 2606	Ph 81 2824
		92 2964



A wish come true ... from Yaesu to you — the FT-901DM

The Radio of Tomorrow Here Today

Delux HF Transceiver FT-901 DM has it all. Only the "DM" model has all the usual "options" as standard components

Features

- Unique receiver filtering system with rejection tuning dual-filter variable-width IF bandpass tuning, and a variable audio peak control for maximum selectivity
- Built-in Curtis 8043 IC Keyer which provides excellent immunity from RF interference. Semi break-in with sidetone
- Advanced noise blanker
- Digital readout utilizing bright LED's. Memory system allows you to store any transmit or receive frequency, then recall it with a flick of the switch
- RF speech processor
- Rugged 6146 final tubes, toroidal output circuitry, and RF negative feedback for maximum reliability and purity of emissions. PLL frequency generation for state-of-the-art stability
- 25 kHz crystal calibrator and +5 kHz clarifier for transmit and receive frequencies
- Built-in VOX with front panel gain control

- Selectable AGC system: SLOW-FAST-OFF
- Built-in speaker
- 180 watts DC input for SSB/CW, and 60 watts for AM/FSK/FM
- Choice of supply voltages 100/110/117/200/220/234 plus DC-DC converter for 13.5 VDC for mobile

Specifications GENERAL

Frequency range: All amateur bands — 160m through 10m, WWV 5MHz, plus aux position for extra band
Power requirements: AC 45 watts to 320 watts max. DC 13.5 V—5.0 A to 21 A max (11 A heater off)
Write for detailed colour leaflet on the 901 DM.
Size: 342(W) x 154(H) x 324(D) mm
Weight: 18 kg
TRANSMITTER
Emission: LSB, USB (A3j), AM (A3h), CW (A1), FM (F3), and FSK (F1)
PA input power: A1, A3j—180 watts DC, A3h F3, F1—80 watts DC
Carrier suppression: Better than 40 dB
Unwanted sideband suppression: Better than 50 dB @ 1000 Hz

Spurious radiation: Better than 40 dB below rated output
Transmitter frequency response: 300—2700 Hz (—6 dB)
3rd order distortion products: Better than 31 dB below rated output
Stability: Less than 300 Hz drift from a cold start, less than 100 Hz drift over a 30 minute period after warm-up
Negative feedback: 6 dB at 14 MHz
Antenna output impedance: 50—75 Ohms
Microphone impedance: 500—600 Ohms
RECEIVER
Sensitivity: 0.25 uV for S/N 10 dB
Image rejection: 18—21 MHz—better than 60 dB, 28 MHz—better than 50 dB
IF rejection: Better than 70 dB
Selectivity: WIDTH control at "0" SSB—6 dB, 2.4 KHz, —60 dB, 4.0 KHz, CW/FSK (with optional CW filter installed)—6 dB, 6 KHz, —60 dB, 12 KHz, FM—6 dB, 12 KHz, —60 dB, 24 KHz
Passband tuning: Continuous from 2.4 KHz to 300 Hz
Cross modulation rejection: Better than 80 dB immunity at 20 KHz off 20 dB input at 14 MHz
Desensitization: Better than 90 dB immunity at 20 KHz off 20 dB input at 14 MHz
Audio output: Better than 3 watts @ 10% THD. Audio output 4—16 Ohms

Our years of handling and specializing in this equipment have enabled us to build up a fund of knowledge and technical experience, backed by a comprehensive range of spare parts and service facilities. We don't just sell a set, our concern extends throughout the life of your equipment

Contact us for details of other Yaesu equipment plus the accessories required to complete your station. All equipment from Bail's carries a 90-day warranty and complete service back-up.

JAS7778-58



ELECTRONIC SERVICES

STREET MAIL VK3YS
JIM BAIL VK3ABA

60 Shannon St., Box Hill North, Vic., 3129.
Ph. (03) 89 2213

Yaesu Agents in Australia since 1963

Radio amateur equipment from B E S also sold by ...			
W A	Radio Communication Services, H R PRIDE, 56 Lockhart St, Como, 6152		Ph. 450 4319
W A	WALLIS TRADING CO., 429 Murray Street, Perth 6000		Ph. 21 7809
W A	FARMERS RADIO PTY LTD, 20 Stanley St., Plympton 6038		Ph. 232 2155
W A	O T ELECTRONICS, 151 Westbury Rd., South Launceston 7200		Ph. 44 6763
W A	PRIMS RADIO, 123 Argyle Street, Hobart 7000		Ph. 24 5912
W A	Auxiliary Tooling, STEPHEN KUHIL, 104 Raby St., Mascot, 2050		Ph. 667 1850
W A	Antenna & Novice Comm. Supplies, W E BROOKE, 23 Dalry Street, Seven Hills 2147		Ph. 624 2691
W A	DIGITRONICS, 186 Perry St., Newcastle West 2202		Ph. 62 2040
W A	RYVERCOM, 3rd Blvd, 2 Colford St., Weyba Weyba 2636		Ph. 21 2125
W A	H C BARLOW, 92 Charles St., Ashcroft, Tennessee 38114		Ph. 79 6179
W A	MITCHELL RADIO CO, 58 Alston Rd., Alston 4010		Ph. 57 6630
A C T	QUICKTRONIC, Jim Bland Shop 11, Altree Crt, Phillip 2056		Ph. 81 2824
			82 2894

TECHNICAL CORRESPONDENCE

LF COHERER RECEIVER

Dear Sir,

I was very interested in the picture of the receiver shown on page 13 of the AR for March 1978.

I had not seen this picture before, so decided to study it and analyse its set-up, to convince myself whether it is genuine or not.

I enclose a sketch with my identification of its components, suitably indicated.

From this I have deduced the circuit of the receiver as I see it.

The additional loading inductance may seem unnecessary, but it must be remembered that the aerial was to be used with a balloon or a kite, as high as possible, as Marconi had proved in his early experiments the higher the aerial the louder the signals.

It must also be remembered that Oliver Lodge and Alexander Muirhead in England, and Karl Ferdinand Braun, the inventor of the Cathode Ray Oscilloscope, in Germany, had all obtained patents before Marconi. In 1900, obtained his famous "Four Sevens Patent", so all were already using tuned circuits and loose coupling between the spark-gap circuit and the aerial circuit.

The installation of a receiving station at South Wellfleet, on Cape Cod, Mass., in the United States, was destroyed by a tremendous storm, so Marconi and his two assistants sailed to Newfoundland, where he improvised a receiving station on a plateau called Signal Hills, near St. Johns.

After two balloons had burst and one kite been blown away, the second kite took the aerial to a height of 130 metres.

To bring such a long wire into tune with the secondary circuit the approximate amount of inductance would be inserted in the aerial circuit and then resonance be obtained with the variable condenser.

Ambrose Fleming had been employed in developing the power supply and the transmitter at Poldhu, but it is doubtful if he had yet developed his Cymometer (wave meter), as there does not seem to be any record of the wavelength of the Poldhu signals. The power generator was designed to provide 10 kW output but my old friend Kemp, who was with Marconi at Signal Hill, told me it was probably overloaded to 12 kW and that was the chief reason that only dots were sent, as if long dashes were sent, the generator might burn out.

Although the actual wavelength employed may not be known, it must be taken that the closed circuit in the receiver would have been adjusted to that of the transmitter before it left Poldhu.

A very sensitive relay is shown in the picture to operate the morse inker (not

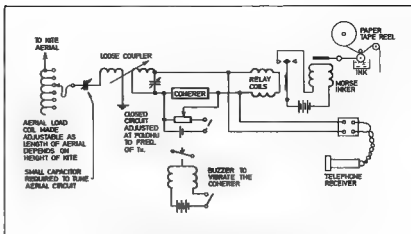


FIG. 1: Circuit of Marconi 1901 Receiver.

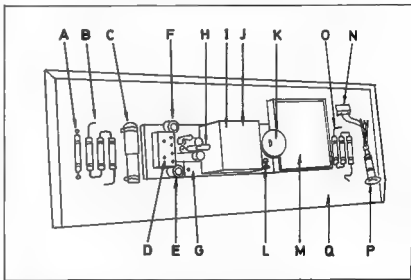


FIG. 2: Component Identification.

shown), thus giving a permanent record of the received signals. However, it appears the signals received were not strong enough to operate the relay so the Branly coherer was replaced by an "Italian Navy Coherer". This consists of two plugs of iron or carbon separated by a gap of a few millimetres into which a drop of mercury was introduced. A small battery ("A" on the picture) was placed in series with this coherer and the relay and inker replaced by an ordinary telephone receiver.

Persons sceptical of the success of Marconi's tests were shortly afterwards convinced when, homeward bound, Marconi on the US liner Philadelphia received messages from Poldhu at nearly 3500 km distance, equivalent to the distance to Cape Cod.

It appears to me that the photo is either of the genuine receiver used or a good replica. I believe the former, as the ab-

sence of the morse inker, the presence of the telephone receiver and the single dry battery to operate the special coherer all add to enforce this belief.

Newton Wade VK4QW.

- A Single dry cell, for use with the Coherer.
- B Three dry cells in series to operate vibrator G.
- C Probably a variable capacitor using glass tubes.
- D Antenna loading inductance, with 6 tappings
- E Antenna terminals.
- F Terminals to take the end of a tapping lead with clips to fit on to tappings of aerial inductance.
- G Buzzer vibrator to de-cohere the Coherer
- H Part of the Coherer.
- I Screened box containing loose

Note: The closed circuit will have been tuned to resonance with the Poldhu transmitter before leaving and this box protects it by "fiddlers" who cannot resist from being altered in transit or turning a knob if accessible.

- J Probably a variable capacitor or inductance for the purpose of tuning the closed circuit.
- K Sensitive polarized relay with adjusting screw L.
- L To adjust the position and pressure of the relay contact.
- M Empty tray — previously used for the "Morse Inker" worked by the relay contacts and battery O.
- N Terminal block for telephone leads — connected across the relay coils. To be used if signals too weak to operate the relay.
- O Three dry cells in series.
- P Telephone receiver.
- Q Table top — probably with folding legs or for use with trestles.

Dear Sir,

Subsequent to writing the article on phase modulation (AR June 1978) I have made several modifications to the circuits published to achieve improved performance.

These are as follows:

1. Fig. 2. Phase Modulator.
 - (a) Replace the 100k ohm feedback resistors of IC1 and IC2 with 1M ohm resistors.
 - (b) Change the 330 pF capacitor to a 33 pF capacitor.
 - (c) Change a 0.0047 uF capacitor between VR1 and the microphone connector.
 - (d) Change the 100k ohm resistor between IC1 and IC2 to 470k ohm and insert a 0.047 uF capacitor in series.

2. Fig. 4. Frequency Modulator Circuit.
 - (a) Insert a 0.0047 μF capacitor between the microphone and the 250k ohm potentiometer.
 - (b) Change the 100k ohm feedback resistors of IC1 and IC2 to 1M ohm resistors.
 - (c) Change the 10k ohm resistor between IC1 and IC2 to a 270k ohm resistor.

Yours faithfully,

I. E. Barwick VK3ALZ

428 Ligar Street,
Ballarat, Vic. 3350.
June 27, 1978.

The Editor,
Dear Sir,

In "Letters to the Editor" of June AR, reference was made by Bruce VK5OR to information missing from my article on 160m multiband antennas published in AR April 1978. The information Bruce requested is as follows —

(1) The dimension missing from Fig. 1 is that for the 180m "tail". This dimension is approximately 40 feet or 12.4m. It was in the original MSS but did not appear on the diagram as published.

(2) Bruce draws attention to a point which I had overlooked: Complicity: the reference points for the dimensions of the wire sections of the antennas in both Fig. 1 and Fig. 2 are not specified. I hasten to apologize for the omission but I fear that I am not now able to supply any exact information. The best I can do is to say that I measured the wire sections up to the ends of the traps, which were each about eight to nine inches in length. Again I stress that these dimensions are given purely as a guide and should not be regarded as a blueprint.

Yours faithfully,

Arthur Solomon VIC3LJ

AROUND THE TRADE

THIS REMOTE COMMUNICATIONS COMES TO AUSTRALIA

Trio-Kenwood (Australia) Pty. Ltd. was established in August 1977 and commenced operations in October 1977 to distribute the HI FI products of its Parent Company, Trio Kenwood Corporation of Japan.

More recently Trio-Kenwood Communications (TKC) Division was registered as a subsidiary of Trio-Kenwood (Australia) Pty. Ltd. (TKA). Both are wholly owned by the Japanese manufacturer but managed and staffed by Australians with the aid of key personnel on loan from Japan, and on May 5th this new company launched into the Amateur Communications market with a dedicated objective of providing "Professional facilities to Amateur Radio Operators".

Administration and accounts will be through the main Australian Company (TKA) at 30 Whiting Street, Arlramon, NSW, but the Communications Company (TKC) has its own premises, including warehouse, showroom, offices, services department and spare parts store, across the street at 31 Whiting Street, Arlramon.

TKC is drawing on the world marketing and servicing expertise of its parent company and multi-national subsidiaries to establish stock, spare parts and servicing facilities which will adequately support the excellence of design and execution for which Kenwood Communications products are famous.

Any one of our staff members is waiting for the opportunity to prove that "Kenwood is the Pacesetter in Amateur Radio".

Just phone (02) 439 4322 — Heather will direct you to the right answer. ■

**REPORT ALL
INTRUDERS TO
THE INTRUDER
WATCH
CO-ORDINATOR
IN YOUR STATE**

LARA

Ladies Amateur Radio Association

This month, apart from celebrating LARA's third birthday, at the end of July, we introduce another in the series of well-known VJ operators, Clarice Adams VK3UE. Clarice formerly held the call VK3VB, which she obtained in 1948, but has changed her call to that of her husband, Stan, to carry on the dilly "UE Net" after Stan's recent death. Stan was a well-known VJ and Stan had a Box Hill QTH, which must have been a great place. Participants in the Jamboree of the Air will remember it, as will their many visitors, amateurs and others. Unlike Austine 3YL and Mavis 3KS, Clarice has not been active in the field of awards and competitions. She denies any proficiency in Morse other than as a means of impressing grandsons with one's own importance. She has a few awards, an apartment, is visited by arrivals such as two sons and a daughter, is not being followed by an equally active career as a grandmother and retired lady of leisure!

Clarence now lives in Eltham, next door to one of her sons, in a house surrounded by trees. As an amateur, of course she lives on a hill with a spectacular view, and the house is easily identified by tower and serials at one end.

During her life, Clarice has enjoyed radio a great deal. She points out that it is an ideal hobby for a house-bound young mother with toddlers, providing an accessible refuge from baby-talk.

Another rewarding facet of their hobby was the contact Clarice and Stan were able to maintain on 2 metres during Stan's long stay in the Austin Hospital. Yet another benefit comes with the host of radio friendships made over the years and visiting and being visited by these friends. Clarice points out that having been born in Mullumbimby and spent a hectic childhood travelling, she is immune to travel-rich and prefers to be visited rather than visit.

An amusing sideline to this history is that Clance, who gained her AACP by diligent study and memory work, starting as a complete novice, scored a higher mark in the exam than Stan — the family "technical expert" — an encouragement to all our novice YLs who are also starting at the beginning.

Good luck to all in the exams.

33e, Kate Duncan

DIVISIONAL NOTES

TRIAL NOVICE EXAMINATION

It is the turn of the WIA (NSW) Education Service to conduct the next trial Novice Examination prior to the October, 1978, Official Tests by the Post and Telecommunications Department.

The date for the trial will be on Saturday, 18th September, 1978, starting at 2 p.m.

Course instructors and individual candidates are asked to indicate in writing their intentions to participate. Letters should be sent to:—

The Education Officer

WIA (NSW) Education Officer,
P.O. Box 109, Toongabbie, NSW 2146.

Clubs and courses are asked to support this trial novice effort, which will be the first WIA-conducted examination based on the new Novice Syllabus issued by the Department of Post and Telecommunications.

An examination fee of one dollar per candidate will be payable to meet the considerable cost of conducting this examination. Cheques, Money Orders and Postal Orders should be made out to "WIA (NSW) Education Service" — and not to any specific person. Full details of this operation will be sent in ample time to make adequate local arrangements.

**SUPPORT OUR
ADVERTISERS**

WHEN PURCHASING GOODS,
SAY YOU SAW THEM ADVERTISED IN AR

ATV PICTURES FROM THE SKY

On Sunday, 11th June, listeners to the Wireless Institute morning broadcast in Melbourne were informed that they might expect to see fast scan ATV pictures emanating from a Piper Cherokee flying over Port Philip Bay. Indeed, reports of excellent strength pictures came pouring in from all over Melbourne. Aboard the plane, Alan VK3ZTV had his hands full manipulating the camera and handling reports coming in on the 2 metre ATV liaison channel Victor 1. He was aided by Graham, an observer, while Peter VK3YLK, whose camera and transmitter were used in the experiment, did an admirable job of piloting the aircraft.

Alan and Peter, both flyers, had thought of such a transmission many weeks before. It was envisaged that, as well as providing local viewers with interesting aerial shots, the experiment may also provide a method of transmitting ATV pictures on the 70 cm band over a great distance. Several problems had to be overcome. Firstly, how to provide a suitable power source in the aircraft to power simultaneously the camera, the 10 watt ATV transmitter and modulator, a 19 cm picture monitor, and the 2 metre transceiver. After land based experiments it was decided to run the 2 metre rig and the camera from the aircraft 12 volt supply, and the ATV transmitter, which draws 4 amps, from a car battery carried on board for the purpose. The camera and picture monitor, built for 240 volt operation, were modified for 12 volts.



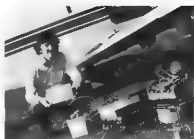
The little "Big Wheel" Antenna used for ATV Transmission, mounted on the aircraft.

Next came the antenna. Since most ATV transmitters operate through high gain beams, it was thought that the low gain that would be afforded by an omnidirectional antenna mounted on the plane might severely limit the signal available for ATV viewers. Some thought was given to a beam mounted on the aircraft but the idea was discarded as impractical. Alan suggested and built a "big wheel" (clover leaf) antenna which was to be mounted on top of the aircraft (actually clamped to the hand hold since it was not possible to drill or bolt any device on to the hired plane). A test transmission was made by Alan from a car atop Arthur's Seat at Dromana. Peter and Ken VK3NJ recorded the successful test transmission which was received at strength 2 in Springvale, nearly 40 miles away.

Final preparations were made on the morning of the flight and a zoom lens to replace Peter's fixed lens for his camera was hastily borrowed from Chic VK3YMA. Chic also organised some publicity for the event. Pictures were first transmitted at 1100 hours as the plane prepared to taxi on to the runway at Moorabbin. Ken, who recorded the event from his base station in Springvale, reported strength 2 pictures which quickly changed to strength 5 as the plane left the ground. Other ATV enthusiasts now realised that there were pictures on the air just before it was announced over the WI broadcast and other video recorders were switched on. Peter VK3BFG recorded some excellent pictures which he later re-broadcast.

It was unfortunate that several problems were evident. The major one was interference in the form of a venetian blind effect on the picture caused by the aircraft's alternator. Another was that the camera field rate, running without the aid of mains locking, was slightly off its normal 50 Hz rate which caused problems in some monitors and VTTRs, and finally some RF feedback was evident at times. But notwithstanding, reports from the ground were excellent, most indicating reception of 4 to 5 strength pictures. Over 20 stations called the aircraft. Les VK3ZBJ went on the air for three minutes to provide pictures from the ground to the plane as it flew over his house in Frankston. Towards the end of the flight the plane's alternator was switched off, eliminating the horizontal band pattern which was somewhat spoiling the pictures. Peter landed the plane safely at 1205 and several ATVer's found they could still receive pictures from the aircraft on the ground. In all, a very entertaining morning for Melbourne's ATVer's and possibly a first of its kind in Australia.

A second aerial transmission on Sunday, 25th June, overcame the major problems



Alan VK3ZTV beside the gear used for the ATV Transmission.

of the first, however a new camera, this time with built-in electronic viewfinder proved to be susceptible to RF feedback due to the proximity of the antenna with the camera in the aircraft. ATVer's gave good reports of the by now nicknamed "Flying Circus" as pictures were rediated from over Port Phillip Bay near Mornington. Melbourne's ATV enthusiasts can look forward to future aeronautical mobile transmissions, as Peter and Alan have advised that the series is not yet over. ■

COMMERCIAL KINKS

RON FISHER
VK3OM

The new Kenwood TS-520 must be one of the most popular of the new transceivers. Mr. V. Kitney VK8VK is obviously an operator who takes advantage of many modes and has adapted his TS-520 to accommodate his special needs. I am sure that many readers will find them of interest.

TS520S MODIFICATIONS

Having purchased a new transceiver, I found that some modifications would be necessary to make the unit compatible with my existing station layout. The following is a resume of the work undertaken.

MODIFICATIONS

1. To permit remote transmit-receive control.
2. To disconnect final filaments when transverter RF output is used.
3. To permit frequency shift keying of the VFO for RTTY operation.
4. To maintain receiver in USB mode while using CW mode for RTTY operation.
5. To change Xverter RF output to high impedance.

NOTES

1. Remote transmit-receive control is obtained by dressing a thin shielded lead from pin 55 on VOX unit to pin 11 on the

Xvter multiway socket. Remote return to earth is via pin 9 on the Xvter multiway socket. Ground the shielded lead both at pin 9 and at the VOX board.

2. Remove the two filament wires from pin H on final unit board. Between the ground portion of the board and the freshly removed wires, use a .047 ceramic capacitor as a stand-off support. Obtain some lightweight twin flex wire and connect the pair one side to pin H and the other side to the "hot" side of the .047 capacitor. Carefully thread the twin flex along the tube towards the eight pin remote socket on the rear panel, and connect the ends to pins 2 and 7. It is now necessary to use an eight pin plug with a jumper lead wired between pins 2 and 7 to complete the filament circuit to the final for normal operation.

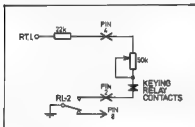


FIGURE 1

3. Frequency shift keying is achieved by connecting one end of a 22K resistor at pin RT 1 on the AVR board, the other end of the resistor has a thin wire threaded along an existing hole to the Xvter multiway socket pin 4. An external FSK control is made up using a small piece of veroboard glued to the multiway plug and mounting a 50K tab pot on the board to set the frequency shift. The return circuit for FSK is via pin 2 of the Xvter socket and the spare contact on 4L 2. To gain access to RL 2 it is necessary to remove the exhaust fan from the rear panel. Carefully solder and sleeve the connection of a thin wire to the spare contact of the relay, and then thread the lead via an existing hole to pin 2 of the Xvter socket. FSK is prevented from affecting the received signal by the action of RL 2. (This is clarified by referring to diagram A.) Use the RIT function to offset the receiver during FSK reception.

4. For FSK reception refer to CAR unit. Remove the lead from pin CWR and re-connect to pin USB.

5. The Xvter RF output is changed to high impedance by removing the coaxial centre lead from the RCA socket. Connect a 10 pF ceramic capacitor from pin 5 of the final tube socket to the centre pin of the RCA RF output socket.

CONCLUSION

The above modifications have permitted greater flexibility in the use of the TS502S in my situation. Perhaps these changes will give you some ideas to try

THE KEN KP202

It's quite some time since we have discussed this little transceiver in Commercial Kinks. As I use my Ken mainly for monitoring the local repeaters on receive only, its low output on transmit did not become obvious until I was preparing the rig for an aeronautical expedition to the Northern Territory. The low output referred to is not low output from the transmitter, but the ability of the whip antenna to convert the transmitter output to useful RF. The problem seems to be that the whip or the short helical antenna has no ground plane to work against. Add a ground plane and the radiated RF increases by about 15 dB. Well of course it's just not convenient to attach a normal ground plane to a Ken, but it is easy to connect 48 cm (19 inches) of flexible wire to the earth side of the antenna connector. Just let this hang down and then note the improved reports. I have tried to reduce the length of this ground plane by introducing loading but so far without much success. However, this all explains why the ICOM IC-215 will outperform the Ken. The microphone lead on the 215 provides an excellent ground plane effect. Next month some modifications for the Yaesu FT-75.

20 YEARS AGO

Ron Fisher, VK3OM

REPEATER

Justification was the theme of the Editorial page of the August 1958 *Amateur Radio*. Federal Executive questioned the old saying of "Use them or lose them." They point out that just because a band sounds dead at one particular location this does not indicate overall activity. Amateurs are using the bands all right, they said, and they will therefore be justified in expecting to maintain the bands they have after the next ITU Conference.

The CHL Modulation System. Don Haberecht VK2RS described a new form of carrier controlled screen grid modulation. Advantages claimed included simplicity of construction and setting up and more effective modulation. This was achieved by running the modulated stage to a higher than normal peak input. CHL modulation was not recommended for use on the HF bands as it could cause some splatter.

Remember the 298 kHz band? It was still with us in 1958, and J. Oculowicz VK2AI described a crystal controlled converter with 8 to 14 MHz output for use on that band. Four 6J5s were used.

Part six of *Amateur Television* by Eric Cornfield described the master monitor and its associated regulated power supply.

The overdrive crystal oscillator was widely used in VHF gear during the fifties. Bob Winch VK2OA showed how they worked and how to get them working — not always an easy job.

An all band crystal converter with one crystal or 80 to 2 metres with an 8.8 MHz crystal and a receiver tuning range of 12 to 16 MHz. The author preferred to remain anonymous.

Meet the other amateur and his station featured Hans Ruckert VK2AOU. Hans was and still is well known for his antenna articles. All the gear was home built and, going on the list of achievements, worked as well as it looked. One full page was devoted to acknowledging donations to the ITU fund, with a total to date of over \$2,000.

REPEATERS

MT. GININI REPEATER 7

As most amateurs will probably now be aware, the VK1RGI channel 7 repeater installation on Mt. Ginini was broken into some time early Saturday morning, 1st April, and the repeater stolen. The thieves stole the entire kit, including the duplexer assembly, and left only the antenna system intact. To gain access to the repeater itself, the thieves cut through a chain securing the concrete pad, and then cut a hole in the side of the building housing the repeater, thereby shattering the existing alarm facilities. It was a very real, professional job and care was taken to ensure that the repeater was removed as a unit — only two hardened cables were cut in the removal operation. Co-located University electronic equipment was not touched, which strongly suggests that the unit was not merely taken for stripping into parts. It would also appear that spite or malice was not the motive, as a much more dramatic demonstration of this would have been the unit's destruction *in situ*. In fact we can think of no rational reason for the theft. If the intention of the thieves was to re-use the repeater (suggested by its careful removal), whether on an illegal or legal basis, the number of scanning receivers around the place, and together with the amount of publicity in the theft has and will continue to receive, then its operational usefulness may be detected in time. Additionally, the skill and sophisticated test equipment required to change the repeater's operating frequency would defeat all but a very few highly qualified people who may want to change its channelling. Maybe the problem is that we are looking for some sort of rational reason for this theft and are ignoring the fact that it could be some twisted person's idea of an April Fool's Day "joke". The police are continuing their investigations and any information, even rumours, regarding the theft should be passed on to them via Eric VK1EP, who is maintaining liaison with them.

Well whatever the reason for the theft we are now down one repeater. At the committee meeting held on April 3rd, it was decided that as a matter of priority another repeater be installed at the same site, this time with additional security measures. An appeal was also launched to cover the costs associated with the new repeater construction and give the volunteers a hand. The constructor or work have been called for. Peter Smith VK1OS, the "father" of VK1RGI, has assisted in designing and building a replacement rather than buying commercial gear. The VK1 Division already owes Peter an immeasurable debt thanks for his three and more years spent designing and constructing both (VK1RAC, VK1RGI), and we should all show our appreciation. It is not cold cash terms for the duplexer assembly and, secondly, by spreading the workload over more people — just because you don't have fancy qualifications doesn't mean you can't help — your contribution in hauling meters up to the site is just as important in getting the new repeater installed as wiring up the various boards. Please contact Peter if you can help in ANY way — but please be prepared to honour your commitments when the time comes.

From "Forward Bias".

TRADE HAMADS

For a very long time commercial advertising has not been accepted in AR Hamads, but as the result of discussions at the 1978 Federal Convention a decision was made to open up a "Hamads-Trade" section. The rate will be \$10 for 4 lines plus \$2 per line (or part thereof), minimum charge \$10, prepayable. Copy is required by the first day of the month preceding publication. This will mean that in future ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

New Release \$295



TRANSVERTER MODEL MMT 432/144S

UTILIZING an IF of 144MHz * 10 WATTS DRIVE OF 1/2 WATT * VOX OPERATED, TWO SELECTABLE RANGES
FEATURES EXTENDED COVERAGE FOR OSCAR 8

This 432 solid state linear transverter is intended for use with a 144 MHz transceiver to produce a high reliability transceive capability. A 10 watt load and RF sensing network eliminates the need for any ancillary circuitry. A simple coaxial connection is all that is required between the transverter and the associated 144 MHz transceiver.

A wide range of applications is offered by the MMT432/114 transverter, which by virtue of its linear mode of operation will enable 144 MHz SSB, FM, AM or CW equipment to be used at 432 MHz, to 436 MHz.

Simply connect direct to your 2 metre rig, 12 volt supply, fit 70 cm antenna for instant SSB, FM, AM, CW operation, coverage 432-434/434-436 in two ranges.

FEATURES: High quality double-sided glass fibre printed board * Highly stable zener controlled oscillator stages * PIN diode aerial changeover relay with less than 0.2 dB through loss * Extremely low noise receive converter, typical 3 dB * Separate receive converter output gives independent receiver facility * Built-in Automatic HF VOX with override facility * Built in 10 watt 144 MHz termination, selectable attenuator for 1/2 watt * Use of the latest state of the art Power Amplifier transistors provide reliable 10 watts continuous output

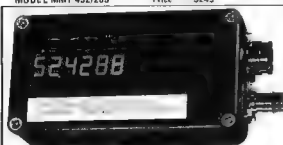
MODEL MMT432/144S Price \$295

TRANSVERTER MODEL MMT 432/28S Features extended coverage for Oscar 8

Second Crystal Oscillator gives two ranges Low 432 - 434 MHz - High 434 - 436 MHz Programming available to either Transmit/Receive both Low, both High, or a mixture of the two, Adjustable Drive Level is now provided by an input potentiometer. Optional RF VOX. Power Output 10 watts minimum * 28 MHz IF * Drive 1 mW to 500 mW * Aerial Changeover by PIN diode switch * Modern Microstrip Techniques * Power requirements 12 volt nominal at 150 mA 2.5 amp. peak * Case size 187 x 120 x 53 cm * Spare 432 input socket:

MODEL MMT 432/28S Price \$245

MODEL MMT 144/28 Price \$185



500 MHz COUNTER Model MMD050/500

SPECIFICATION

Digit Height	10 mm
Display Width	45 mm
Case Size	111 x 80 x 27 mm
Frequency Ranges	0.45 - 50 MHz, 50 - 500 MHz Better than 50 mV RMS over 0.45 - 50 MHz Better than 200 mV RMS over 50 - 500 MHz
Input Connector	50 ohm BNC
Input Impedance	200 ohm approximate
Power Connector	5 pin 270 deg. locking DIN socket (supplied with plug)
Power Requirements	11 - 15 volts DC at 300 mA approximately

Model MMD050/500 - 500 MHz Counter \$175

DUAL RANGE 432 - 434 MHz & 434 - 436 MHz CONVERTER TYPE. MMC432/28S & MMC 432/144S

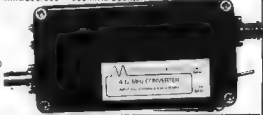
Price: \$67.00

FEATURES:

- * Extra Range (434-436 MHz) For Satellite Reception
- * Ultra Low-Noise First RF Amplifier Stage
- * Highly Stable Zener Diode Controlled Crystal Oscillator and Multiplier Stages

SPECIFICATIONS:

Input frequency ranges:	432-434 MHz (low) 434-436 MHz (high)
I.F. output frequency	28-30 MHz or 144, 146 MHz
Typical gain:	30dB
Noise figure:	3dB Maximum
D.C. Power requirements:	11-13.8 volts 12.5V nominal
Current consumption:	50 mA Maximum



BNC CONNECTORS - Excellent quality, fully imported from U.K. - U.S. Mil. No. UG98E/U. Price: \$1.35 each.

NEW READY-TO-OPERATE MODULES AVAILABLE IN THE SALES PROGRAM OF VHF COMMUNICATIONS.

All modules are enclosed in black cast-aluminium cases of 13cm by 6cm by 13cm and are fitted with BNC connectors. Input and output impedance is 50 ohms. Completely professional technology, manufacture, and alignment. Extremely suitable for operation via satellite or for normal VHF/UHF communications.

6 METRE MOSFET CONVERTER

Featuring 24 MHz local oscillator output for transverter use:

Input frequency	52-54 MHz
I.F. Output Frequency	20-30 MHz
Typical Gain	30 dB
Noise Figure	2.5 dB
Typical Image rejection	85 dB
Crystal Oscillator Frequency	24 MHz
Power requirements:	12 volt ± 25% at 35 mA

MODEL MMC52/28LO Price: \$49.00

1296 MHz CONVERTER

Microstrip, Schottky diode mixer, IF: 28-30 MHz or 144-146 MHz
Noise figure: typ. 8.5 dB
Overall gain 25 dB Price: \$65.00

CONVERTERS PACK & POST \$2.00

144 MHz MOSFET CONVERTER

Noise figure: typ. 2.8 dB.
Overall gain, typ. 30 dB.
IF: 28-30 MHz, 9-15 V 20 mA.
Price: \$45.00
VARACTOR TRIPLER 432/1296
Max. input at 432 MHz, 24 W (FM, CW) - 12 W (AM)
Max output at 1296 MHz 14 W
Price: \$74.00

AMATEUR ELECTRONIC IMPORTS IS THE EXCLUSIVE AUSTRALIAN DISTRIBUTORS FOR THESE PRECISION BRITISH MADE UNITS FROM MICROWAVE MODULES LTD.

All prices subject to change without notice. Onwards forwarding please add sufficient for freight or postage. Excess will be refunded.

Amateur Electronic Imports

P.O. BOX 160, KOGARAH, N.S.W. 2217
TELEPHONE: (02) 547-1467
CABLE: "AMATEURIMPORT, SYDNEY"



THE NEW TS 520S



KENWOOD

...pionniers in amateur radio

A NEW STANDARD IN ECONOMY TRANSCEIVERS

Full coverage 1.8 to 29.7 MHz * Outstanding Receiver Sensitivity and Minimum Cross Modulation * Vernier Tuning for Plate Control * Highly effective Noise Blanker * New Improved Speech Processor * RF Attenuator * Easy connection to Phone Patch * Fully compatible for optional 6-Digit Read-out * Price: TS 520S **\$685**

KENWOOD SM - 220 STATION MONITOR
KENWOOD BS - 5 and BS - 8 PAN ADAPTOR
FOR USE WITH SM - 220 and TS520/TS820
KENWOOD DG - 5 DIGITAL DISPLAY FOR TS520S
KENWOOD AT - 200 ANTENNA TUNER UNIT
ICOM MODEL IC - 211
YAesu FL - 2100B LINEAR
YAesu FT - 225RD, 2 meter transceiver
YAesu FT - 625D, 6 meter transceiver

P.O.A.
P.O.A.

P.O.A.
\$169
\$750
\$565
P.O.A.
P.O.A.

YAesu FT - 901 DM

P.O.A.

SWR METERS

\$ 28

TWIN METER - 3.5 to 145 MHz
BNC CONNECTORS - Mil. Spec.

\$1.35 each

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ONWARDS forwarding. Please add sufficient for freight or postage, excess will be refunded.

FOR AMATEUR EQUIPMENT BASED ON COMPETITIVE PRICES, PHONE OR WRITE TO -

Amateur Electronic Imports

P.O. BOX 160, KOGARAH, N.S.W. 2217

TELEPHONE: (02) 547 1487

CABLE: "AMATEURIMPORT, SYDNEY"

YAesu and KENWOOD

FT-101, FR-101, FT-301
TS-520, TS-820

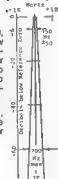
CW Ops!

Since all CW Filters are optional, why not get the best? This new sharp filter is ideal for DX and contest work; yet not TOO narrow for regular operation. Superior to audio filters, yet works well with them to improve receiver performance, if desired.

Mounts easily on circuit boards, pre-drilled for this purpose by the manufacturer. See your manual for install or instructions.

A BUILD-IN component; not a HANG-ON.

No alignment required
Satisfaction guaranteed.



Compare!

250 Hz COMPACT XTAL FILTER

\$57 POSTAGE PAID

Have the BEST and SAVE!

WIN YOUR BATTLE AGAINST QRM

Mail your order, indicating type of rig and quantity required, with cheque or money order.

Allow up to 4 weeks for delivery.

FREE QUOTES to retailers for quantity orders of crystals and crystal-filters.

PIEZO ELECTRIC PRODUCTS

7 JASPER STREET, GREYSTANES, 2145, N.S.W. 631-4946



"SHURE"

(MADE IN USA)

Communications Microphone

MODEL 401A
High Impedance

Price \$37.50

(Posted anywhere)

Model 401 Series hand-held communications microphones are compact size, **CONTROLLED MAGNETIC** units designed for clear, crisp, natural voice response of high intelligibility.

CLEAN TRANSMISSION IS

"SHURE"

WITH THIS MICROPHONE

WILLIAM WILLIS & Co. Pty. Ltd.

MANUFACTURERS AND IMPORTERS

77 CANTERBURY ROAD, CANTERBURY, VIC. 3218
PHONE 836 0707

BUY DIRECT FROM THE IMPORTER?



WHY NOT WHEN WE OFFER YOU : —

lower prices as well as 90 day warranty,
pre-sales checked sets and back up service.



GREG WHITER
VK3JA

At GFS you have the choice of either YAESU or KENWOOD and, because we buy direct from Japan, (not just from a local distributor) we are in a position to sell to you at lower prices. Both brands are supplied with English handbooks, wired for 230—240 Volts AC and have 3-Core AC power cables with Australian Standard 3-pin plugs. So don't be confused by "Community Service Announcements". For a high quality product and personal service call GFS.

HF WADLEY LOOP COMMUNICATION RECEIVER

STANDARD C-6500

WHY PAY MORE FOR YAESU AND KENWOOD

FT-101E	160-10M 260W TCVR	\$ 898
FT-101DM	160-10M 200W TCVR	\$945
FT-7	80-10M 25W TCVR	\$ 548
FT-201E	80-10M 25W TCVR	\$ 710
FT-301	160-10M 200W TCVR	\$ 940
FT-321D	Double 200W TCVR	\$1140
FT-201	20 Amp 301 Series PS	\$ 169
FT-100B	40-10M Linear Amp	\$ 554
VO-301	301 Series Monitorscope	\$ 275
VO-100	101 Series Monitorscope	\$ 263
VP-150	Dummy Load/Whistle	\$ 95
FRG-1000	Signal Generator	\$ 685
TD-820E	120-10M 200W TCVR	\$ 719

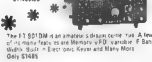
NEW!

250K CW Crystal
Filters in our popular
handbooks
Type 3F 250K to suit
Yaesu IGI Series
S67 58
Type 3BH 250 to suit
Kenwood TS-505
\$63
\$45.50

THE INCREDIBLE FT 901DM

Why pay \$1 499.95 for the FT-901DM just some
customers think you can get the same thing the FT-901DM
from GFS for only

\$1 465.00



The FT 901DM is an amateur's dream come true. A few
customers think you can get the same thing the FT-901DM
from GFS for only \$1 465.00

EMULATOR ROTATORS

MODEL 101, BX Medium duty
Rc or an torque 450 Kg/cm
1500 kg m
\$145

MODEL 192KX Heavy Duty
Rotation torque 800 Kg/cm
4000 Kg/cm
\$218

MODEL 1102MKX Extra Heavy Duty
Rc or an torque 800 Kg/cm
10000 Kg/cm
\$317

1211 Mar Clamp for 80, 8X \$ 17
1213 Mar Clamp for 502KX \$ 27
12 5 Mar Clamp for 1102MKX \$ 42

GFS - EXPERT SERVICE
MANY YEARS OF EXPERIENCE IN THE
AMATEUR RADIO AND COMMUNICATIONS
SERVICES INDUSTRY PROVIDES US WITH THE
BACKGROUND AND KNOWHOW TO
OFFER YOU THE BEST IN SERVICE INC.

FAMOUS YAESU FT 101E TRANSCEIVER

Yaesu's great model FT 101E
from GFS comes to you at a
price that is very hard to hear
For instance 260 watts PEP
operation on 160 through 10
meters plus add 12 Volts DC
or 22V Volts AC

The FT-101E is updated RF SPEECH PROCESSOR provides
that extra 10% power needed to cut through most of those bad
pick ups and heavy QRM Daily \$895

MORSE CODE KEYS

OF ARE NOW STOCKING THE WELL KNOWN
HAGINDA BRAND OF MORSE CODE KEYS

HK 710 Commercial quality Key \$42.80

HK 704 High quality Key \$16.99

CK 1 Code Practice Oscillator \$12.50

CO AXIAL CABLE

RG 58/U 5.0dB/100 ft at 100MHz \$0.45/m

RG 58/U 5.0dB/100 ft at 100MHz \$1.28/m

PL 258 Connectors to suit RG 58, RG 58 \$1.18 m

SO 238 Sockets \$1.18 m

THE ANSWER TO THE NOVICE'S DREAM

AT A NOVICE'S PRICE

FT-7

FEATURES

Modern compact styling for

easy on/off, dual output

Size 230mm x 100mm x 250mm

50 or 10 metre operation

VFO controlled

Noise Reducer that early works

Facilities for band channel operation

Ideal for the shack or the mobile at a price that you can afford.

Only \$548 including reliable output, microphone and cables.

SWISS QUADS

Offer high forward gain

low to 14dB narrow

beam widths and good

front to back ratio

SW 20M 20M Swiss Quad \$265

SW 45 14M Swiss Quad \$140

SW 10 10M Swiss Quad \$135

HIDAKA MODEL VS-22

10 and 15 metre Duo-band

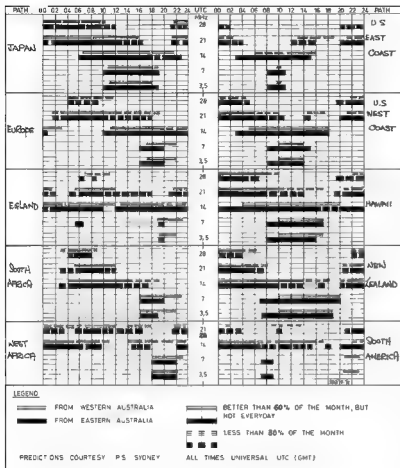
3 element yagi. Our price \$172

All GFS equipment is sold as checked and where AC mains operated they are wired with 3 core power cables, 15 and 16/15
90 DAY LIMITED WARRANTY TO ALL EQUIPMENT BUT DOES NOT COVER FINAL TUBES OR SEMI CONDUCTORS. PRICES AND SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

G.F.S. ELECTRONIC IMPORTS 15 McKEON ROAD, MITCHAM, 3132. (03) 873 3939

IONOSPHERIC PREDICTIONS

Len Poynter VK3ZGP/NAC



PROGRAMMES SPECIFICALLY FOR DXERS AND KEEN SHORTWAVE LISTENERS

SPAIN
"DX Programme", Saturdays 2220-2225

WEST GERMANY
"DXer's desk", Saturdays 1730 GMT. Other DX programmes are transmitted by the "Voice of Germany".

JAPAN
"Tokyo Calling" (DX news and programme guide). Sundays 10000

ECUADOR
"DX Parlyline" with Helen and Cayton Howard, Mondays, Thursdays and Saturdays at 0900. A different half hour each day!

NEW ZEALAND
"Arthur Cushen's DX Word" on the First Sunday of each month at 1915 GMT. "Mail box" on the 3rd Sunday of each month also at 1915 GMT (during the day-light saving months these programmes are transmitted one hour earlier — 0915 GMT)

BRITAIN
"World Radio Club", Wednesdays at 0815, 1330 and 2315, and on Fridays at 2100 (Saturday morning in Australia)

HOLLAND
"DX Jukebox", Thursdays approx 15 minutes after the end of each broadcast. It's a weekly session for shortwave listeners and DXers the world over. First Thursdays: SW propagation predictions by Maarten van Delft and Arthur Cushen's Pacific Report. Other Thursdays: regional DX reports from Jan Turner (Sweden), Glenn Hauser (USA), and Victor Goulet (Ile de la Reunion). Also technical mail bag in each programme. Ask for the free DX Information Service Catalogue. Technical information by Wim van Amstel. Produced and presented by Dick Speekman. The address "DX Jukebox", Radio Nederlands, PO Box 222, Hilversum, Holland.

SOUTH AFRICA
"DX Corner" with Gerry Wood; Wednesdays and Saturdays during the last half-hour of the transmission.

SWEDEN
"Sweden Calling DXers", the 30-year old programme from Stockholm is a must for the active DXer. Each Tuesday, 15 minutes is devoted to the programme. Also host George Wood will be presenting "Shortwave Corner", every Thursday during June, July and August featuring different facets of radio, especially in Sweden.

AUSTRALIA
"Club Forum" is the DXers programme on our own international service. Each Saturday the programme is repeated several times at 0240, 0640 and 1440. The programme is aired at 8 am Melbourne time on 6150 (7.30 am in South Australia). Also featured on the programme are the latest tips in the "DXers Calling" segment.

AUSTRIA
"Austrian Shortwave Panorama" is aired each Sunday at 0300 and 0915

SWITZERLAND
"Swiss Shortwave Merry-go-round" is aired on Saturdays but only on the Second and Fourth Saturdays. Bob Thomann and Bob Zanotti will keep you up-to-date on international radio around the world. Why not ask a technical question?

CANADA
"DX Quest" with host Ian McFarlane host the programme transmitted on Sundays.

Check the World Radio and TV Handbook for further information.
Information from "DX Post", June 1978, the publication of the Southern Cross DX Club.

QRP

AR ADDRESS LABELS

Your AR address label can convey much information to you. If any of it is incorrect write it at once to have it corrected, preferably write to the Executive office for changes in name, address and call sign and to your Division for other changes.

Firstly, are your name, initials, title, address, post code and call sign correct? If there is an error write it at once to have it corrected. If your letter reaches the Executive office before the middle of the month the correction will appear in next month's AR label. If, as often occurs, your letter is received later than mid-month, you will have to wait for one further month's AR label for the correction. The computer input goes in once a month shortly after mid-month.

Secondly, the coding which forms the fourth line of the label details the first character is alphabetical to signify your grade. The various grades and subscriptions applicable to those grades usually appear in AR for December or January each year. The second character is a digit indicating the Division to which you belong, e.g., "4" represents VK4, etc. The next two are 00 digits indicating your subscription is due in December/January. The next is a single digit,

being a distribution code for mailing purposes. The figure "1" is for continents designated by post codes, the figure "2" for New Zealand mailings, the figure "6" for overseas air mail, etc. The postal regulations for Category "B" publications require that each AR for a particular post code must be mailed in one lot with all the other articles in that post code, and further, that certain groups of post code articles must be banded together at the time of posting. The final two digits preceding the call sign are zone identification digits which, at present, will only come into use for Tasmanian addresses.

The call sign on your address label is the one which will go into the next call book. If you hold two call signs please send in the details if you have not already done so.

PENSIONERS

Members are reminded that only the Division can decide who of its members may or may not qualify for the lower concessional pensioner rate. Do not wait until you receive a subscription notice before deciding to claim a pensioner rate. Do it well in advance because you must allow time for various delays. It is better to do it now rather than have your AR cut off because of being unfinancial. Remember, if you wish to apply for pensioner grading do it now and send copies of your papers direct to your Division.

CONTESTS

VK/ZL/OCEANIA

DX CONTEST 1978

- RULES

NZART and W.A. the national amateur radio associations in New Zealand and Australia, invite worldwide participation in this year's VK/ZL/Oceania DX Contest.

WHEN?

Phone — 24 hours from 1000 GMT, Saturday, 7 October to 1000 GMT, Sunday, 8 October

RTTY — Same times as for phone

CW — 24 hours from 1000 GMT, Saturday, 14 October to 1000 GMT, Sunday, 15 October.

RULES

1. There shall be five main sections in the contest —

- Transmitting Phone, Open
- Transmitting CW, Open
- Receiving — "Phone & CW" combined.
- For VK and ZL only — QRP Sections, 5 watts Argusport "Kling"
- Transmitting Phone — QRP
- Transmitting CW — QRP

2. The Contest is open to all licensed transmitting stations in any part of the world. No prior entry need be made. Mobile marine and other non-land based stations are permitted to enter. Their "country status" will be determined by the country which issued the call-sign used in the contest.

3. All amateur bands may be used but no cross band operation is permitted. NOTE: VK and ZL stations irrespective of their location DO NOT contact each other for contest purposes EXCEPT on 80 and 160 metres on which bands contacts between VK and ZL stations are encouraged.

4. Phone will be used during the first weekend and CW during the second weekend. Stations entering both sections must submit separate logs.

5. Only one contact on CW and one contact on phone per band is permitted with one station for scoring purposes.

6. Only one licensed amateur is permitted to operate any one station under the owner's call-sign. Should two or more operate any particular station, each will be considered a compellor and must submit a separate log under his own call-sign. This is not applicable to overseas competitors operating club stations.

7. Entrants must operate within the terms of their licences.

8. CYPHERS. Before points can be claimed for a contact, serial numbers must be exchanged and ACKNOWLEDGED. The serial number of five or six figures will be made up of the RS (phone) or RST (CW) report plus three figures which may begin with any number between 001 and 100 for the first contact and which will increase in value by one for each successive contact. e.g. If the number chosen for the first contact is 021, then the second must be 022 followed by 023, 024, etc. After reaching 999, restart from 001.

9. SCORING. For Oceania stations other than VK/ZL — 2 points for each contact on a specific band with VK/ZL stations and 1 point for each contact on a specific band with the rest of the world.

(b) For the rest of the world other than VK/ZL — 2 points for each contact on a specific band with VK/ZL stations and 1 point for each contact on a specific band with Oceania stations other than VK/ZL.

(c) For VK/ZL stations. Points for each QSO on different bands as follows: 20m — 1 point, 15m — 2 points, 10m — 3 points, 40m — 4 points, 80m — 5 points, 160m — 5 points. Score for EACH

BAND will be the total points score for that band multiplied by the total points worked. NOTE: W, KI, WA1, WN1, A1, N1 (although all in the same call area) are different prefixes and count as multipliers. W6AA/T is same as above and counts as a "W1" and not "W6".

(d) 80 metre section. For 80 metre contacts between VK and ZL stations, each VK and ZL call area will be considered a "scoring area" with each contact counting five points. Each different call area will count as a multiplier.

(e) 160 metre Section. Contacts permissible between VK/ZL, VK/VK, ZL/ZL, as well as VK/ZL to the rest of the world. Each VK and ZL call area will count as a "scoring area" with each contact counting five points. Each different call area will count as a multiplier. NOTE: A contestant may claim points for contacts with other stations in the SAME call area for his 160 metre section.

10. LOGS

(a) Overseas Stations. (a) Logs to show in this order — date, time in GMT, call-sign of station contacted, band, serial number sent, serial number received. UNDERLINE each new VK/ZL call area contacted. Separate log must be submitted for each band used.

(b) Summary sheet to show — call-sign, name and address in BLOCK LETTERS, details of equipment used, and, for EACH BAND — QSO points for that band — VK/ZL call areas worked on that band. "SINGLE BAND" score will be QSO points for that band multiplied by total VK/ZL call areas worked on that band. "ALL BAND" score will be total QSO points for all bands multiplied by total VK/ZL call areas worked on all bands.

(b) VK/ZL STATIONS: (a) Logs must show in this order — date, time in GMT, call-sign of station worked, band, serial number sent, serial number received. USE SEPARATE LOG FOR EACH BAND.

(b) Summary sheet to show — name and address in block letters; call-sign; for EACH BAND — QSO points for that band, prefixes worked on that band, claimed score for that band. "All Band" score will be total of single band scores. Give details of equipment used and declaration that all rules and regulations have been observed.

11. The right is reserved to disqualify any entrant who, during the contest, has not strictly observed regulations or who has consistently departed from the accepted code of operating ethics.

12. The ruling of the Executive Council NZART will be final.

13. AWARDS. Separate awards for phone and for CW.

WORLD-WIDE EXCEPT VK/ZL

(a) Attractive multi-colour certificates to the top scorers in each country (call areas in "W", "J", "U").

(b) Depending on reasonable degree of activity, separate awards may be made for top scorers on different bands.

(c) Where many logs are received, consideration will be given to awarding second and third place certificates.

TO VK AND ZL STATIONS

OPEN SECTION — CERTIFICATES —

(a) To top three scorers in each call area VK/ZL.

(b) To top three scorers on individual bands — (160, 80, 40, 20, 15, 10) in VK and in ZL.

QRP SECTION —

(a) Top three scorers in VK and in ZL.

(b) Others depending on activity.

14. ENTRIES FROM VK/ZL STATIONS should be posted direct to —

NZART Contest Manager ZL2GX,
132 Lytton Road,
Gisborne, New Zealand.

To arrive before 31 December, 1978.

ENTRIES FROM OVERSEAS STATIONS — posted to the above address or the Headquarters, Box 1459, Christchurch to arrive not later than 31 January, 1979.

SWL SECTION

1. The rules are similar to the transmitting section but it is open to all members of any SWL society in the world. No transmitting station is permitted to enter this section.

2. The contest times and logging of stations on each band per weekend are as for the transmitting section except that the same station may

be logged twice on any band — ONCE ON PHONE AND ONCE ON CW.

3. To count for points, the station heard must be in QSO exchanging cyphers in the VK/ZL/Oceania DX Contest and the following details noted — date, time in GMT, call of the station heard, call of the station he is working, RST of the station heard, serial number SENT by the station heard, band, points claimed.

4. Scoring is on the same basis as for the transmitting section and a summary sheet should be similarly set out.

5. Overseas stations may log ONLY VK/ZL stations but VK receiving stations may log overseas stations and ZL stations, while ZL receiving stations may log overseas stations and VK stations.

6. Certificates will be awarded as listed in the section under Awards.

RTTY SECTION

RULES

WHEN?

7th to the 8th October [The same week-end as the VK/ZL Phone section of the contest.]

TIME

10.00 GMT Saturday to 10.00 GMT Sunday

BANDS

All amateur bands 3.5 Mhz to 28 Mhz.

LOGS

Single operator, multi operator, SWL operator. Logs of multi operator stations must be signed by all the operators, together with their call signs. Logs of SWLs must contain both number sent and the number received by the station logged. Incomplete loggings are not eligible for scoring.

NUMBER EXCHANGE

Number will consist of RST, Zone Number and time in GMT.

SCORING

As per GARTG Zone Chart, multiplied by the number of countries worked, multiplied by the number of continents worked (maximum six). World stations add 100 points for each VK and ZL station worked after the above calculations.

Example: 720 points from zone chart x countries worked x 5 continents worked, equals 80 000 points plus six (6) VK/ZL stations worked (that is 600 points), giving a total of 80 600 points. A station may be worked only once on each band, but may be worked on another band for further multipliers.

COUNTRIES

Country count as per ARRL list of countries, plus each VK/ZL, JA, and W/K districts counting separate countries. Contact with one's own country count zero points for multipliers.

LOGS

Call sign must show in this order: Date, Time (in GMT), Call Sign of station worked, Serial number received, Serial number sent and points claimed.

CLOSING DATE

Logs must be received by the contest committee by the 1st January 1979. The address for the RTTY Section of the VK/ZL/OCEANIA DX Contest is: S. E. Molen, 13 Pendle Way, Pendle Hill, 2145, Sydney, NSW, Australia.

SUMMARY SHEET

Summary sheet must show call sign of station, name of operator/s and address of same, bands used (A separate log is required for each band). The points claimed for each band, number of VK/ZL stations worked, total points claimed and signature.

Multi operator stations' logs must contain the signature and call sign of each operator.

AWARDS

Certificates will be issued for 1st, 2nd and 3rd place on a world basis, and 1st, 2nd and 3rd place on a country basis.

The judges' decision on regard to the placings in the contest will be final and no correspondence will be entered into with regard to same. The logs become the property of the contest committee on completion of checking.

VNE-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP

Continued from 8338

AMATEUR RADIO BEACONS

VK1	VK1RTA, Canberra	144.475
VK2	VK2WV, Sydney	82.458
VK2	VK2WV, Sydney	144.018
VK3	VK2RHR, Mittagong	144.128
VK3	VK3RTG, Vermont	144.708
VK4	VK4RTI, Townsville	52.440
VK4	VK3RTT, Mt. Morebilen	144.408
VK4	VK4RBB, Brisbane	144.408
VK5	VK5VF, Mount Lofy	83.60
VK5	VK5VF, Mount Lofy	144.800
VK5	VK5RTV, Perth	82.300
VK5	VK5RTU, Kalgoorlie	52.500
VK5	VK5RTV, Albany	52.800
VK5	VK5RTV, Albany	144.500
VK5	VK5RTV, Perth	145.800
VK7	VK7RNT, Launceston	82.400
VK7	VK7RTZ, Ulverston	144.300
VK7	VK7RTZ, Ulverston	432.475
VK8	VK8VF, Darwin	82.500
JA	JA5SIV, Nagoya	52.600
K8	K8GJDX, Guam	80.118
K8	K8HQB, Hawaii	50.104
TI	TI2NA, Costa Rica	50.090
W	WA5JRA, Los Angeles, USA	50.091
ZL1	ZL1VHF, Auckland	145.108
ZL1	ZL1VHF, Waiuku	145.108
ZL3	ZL3VHF, Palmerston North	145.200
ZL3	ZL3VHF, Wellington	145.200
ZL3	ZL3VHF, Palmerston North	145.200
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400

* The VKOMA beacon has been deleted from listing. There seems no evidence to support that it is operating — perhaps the quickest way to find out for sure will be to remove it.

The frequency of the K8HQB beacon is related as 50.108 MHz, and the calling frequency is 50.110. Confirmation of the comes from Ross VK4RO who also worked K8HQB and WABGUB/K8H on 27-7-8 between 0737 and 0902. Ross has a nice ad hoc listing of his six metre activities will be sent when the 6 metre season finishes. He may never finish in your area, at least maybe not for several years anyway!

NEWS

George P22HV sent along the last issue (March) of "Garnum", the newsletter of the PNG Amateur Radio Society. Included in this is news of net operations on Tuesdays on 14170 kHz at 1830Z and 3820 kHz at 0000Z, with the HF calling frequency being on 7050 kHz on Saturdays and Sundays. So if you want to listen to P22 for a VHF contact try one of the above!

George further reports the first P22 to VK4 Es contact on 146 MHz on 22-1-78 has now been confirmed as being between VK4ZBH and P22WVW. On 4-2-78 PNG changed over from Channel 40 as calling frequency to Channel 50. On 20-5-78 P22RPN — Port Moresby became an operational working repeater on Channel 8, and so far has been working well!

Also forwarded to me is a copy of a letter sent to all PNG amateurs from their Administration on the subject of "Charges to Licensing Condition", viz

"1. From 5th May 1978, all Novice Amateur Operators will be permitted to operate VFO (Variable Frequency Oscillator) control of their transmitters within the Novice Bands, which are 3.565-5.75 MHz, 21.125-21.200 MHz, 28.100-28.600 MHz.

"2. From 5th May 1978, all Full and Limited Amateur Operators will be permitted to operate between 50 MHz to 54 MHz within the 6 metre band. This temporary extension applies until further notice." Oh, well! To live in some areas has its advantages it seems, and the PNG boys have not been slow in making use of their ex-

tended allocation as the following extracts from the P22HV log indicates.

"1-6-78: JA1, 2, 3, 4, 5, 6, K8G, K8HQB, plus East Malaysia, Hawaiian, Chinese and Korean TV 3-6: JA1, 2, 3, and K8HQB, plus above TV reception. 6-8: K8HQB, WABGUB/K8H, K8HQB, K8HQB beacon, JA1, 2, 3, 5, 7 and 0, plus Malaysia, Hawaii, China and Japanese Ch. 3 TV at 2002Z on 107 MHz. 8-5: K8HQB, HLW, JA1, 2, 3, 4, 5, 7, 8 and 0, plus TV from Hawaii, Malaysia, China and Korea. 10-5: K8G, K8HQB beacon, JA2 and 6, plus Chinese TV 12-5: ZL Ch. 1 TV, 2045-2145, mixed (2 or 3 channels). 13-5: ZL Ch. 1 TV, 1415 to 1430Z, and K8HQB, 2007 to 2100Z. 15-5: K8HQB beacon, JA1, 2, 3, 7 and 8, plus J8RTU Toyama special station at 2002Z, plus Hawaiian and Chinese TV.

"15-5: K8HQB, JA1, 2, 3, 4, 5, 7, 8 and 0, plus K8GJDX and Chinese TV 17-5: JA1, 2, 4, 5 and 7, plus Russian and Chinese TV 19-5: K8HQB, JA1, 2 and 7. 20-5: K8HQB, JA8, plus Hawaiian TV 21-5: JA1 and 7, Chinese and Korean TV 23-5: Channel 4 and 6 in colour from Mackay, Qld., but no amateur signals. 24-5: K8HQB, Hawaiian TV, plus JA8 23-5: JA1, 7 and 0, Russian and Korean TV 26-5: K8HQB, and HLW on 49.2 MHz, plus Russian and East Malaysian TV 29-5: K8HQB, K8HQB and J1 31-5 Chinese TV test pattern and contact programs on R1." And so it goes on. If this is the type of reception possible at present what is it surely going to be during the next two years! ... SLP.

SIX METRES

This does seem to be the band with the greatest continuing interest. I have received another letter from Graham VK8GB in Darwin with the happenings in that area. Readers may care to compare notes between P22HV and VK8GB, so here is the listing from Graham:

"15-5 1105Z K8GJH 18-5 1015Z JH2VHL 1023Z JABOMU 22-5 1112 to 1212Z JA1, 2, 3, 4, 5, 6, 7 and 0. 26-5: 1117 to 1202Z JA1, 2, 3, 4, 7, 8, 9 and 0 for 40 contacts, plus HLWV. The contact with JETICOD in Yamsuili was the last before the required to give WAJID on six metres. 27-5 1033 to 1102Z JA8 JAV, JH5VDN, JABEIA, JABRMD, K8GJH and K8GDX 28-5 1400 to 1302Z JA4PHU, JFDWO, JHSTEW and JH1WNS 28-5 1102Z K8GJH, 1125Z K8GJDX

"26-5 1130 to 1102Z K8GJH, JADON, JHTEW and JABZCY 3-6: K8GJH, K8GDX, JA1 and 2 for 6 contacts. 4-6: 1055 to 1157Z K8GJH, JA1, 2, 3 and 0 for 6 contacts. 7-4 0845Z JF3AKH 18-5 1102Z K8GDX, 1120Z K8GJH, 1132Z JHTEW and 1200Z J8IAUW"

Readers will note that when lists of districts worked are mentioned without actual call signs, this numbering of JA1 to 8, etc., really means 1 to 5 call areas, the actual prefixes could be JA1, JH1, JET1, J81, etc. etc.

Graham goes on to say that he hears TV signals on 6-7.5 MHz every day and JA signals on the low and every second day on the average. Weak signals on two metres coinciding with six metre JA openings but no contacts.

"1. [Graham] spoke to KL7FBI on 15 metres on 26-5. The operator is Mike Calmer, Box 643, APO 98736, Seattle, USA. KL7FBI is a military club station on Shemya Is and WA4TNY/KL7 operates out of the shack on six metres. They have a dual 6 metre rhombic with 28 dB gain pointed at JA. I'm not sure of their equipment otherwise, but they suggested that because of the antenna direction VK contacts may be very difficult.

"HLWV advises he is running a dual with LU5X on 50.104 to 2230Z, 0030 to 0345Z daily, and 0900 to 1400Z every week-end. Apparently Alfred LU5X holds the world record for six with a contact to JA8FR on 24-3-56. A contact HLW to LU3 would break this record. Bill HLW also advises that W technicians have all VHF privileges now and that WABJRA beacon is on 50.085. The ARRL beacon segment is now 50.070 to 50.080. VPLAAL has 36 countries confirmed on six!

The following information also came from Graham VK8GB and originated from J8IAUW. "7-4-78, UAO worked JA6 on 144 MHz Es. 11-6: UAO to JA3, 4 and 5 on 144 Es. Also JA8 to JA9 on 144 Es. Also heard W8XJ, K5MYC, K8MBP, WABJRU, NGRN, W8TVZ, K8AUQ and K8HPC between 2200 and 2240Z. J8IAUW same date worked K8HQB and

V56FX (both new stations), K8HQB, V56BE, HLWV, HLSTG and H2H5H. 12-6 H2M and P22DUO 13-6. Worked WABJRU, WABTEW 0520-0602Z 14-6. K8HXB, K8G, P29 and J01 18-6. K8HQB, K8HQA, J01, K8G and P29 18-6. K8HQB 0455 to 0540Z worked WABJRU, WABJRU, KTUO, K7CV, W8HMT and K8HCP. 18-6 K8HQB and heard K8H working W via Es.

"The details of K8HQB beacon are that it is definitely on 50.104 zero beat (1 kHz tone on 50.103). Bert K8HQB can key the beacon and listen from his own OTH on 50.104. On establishing contact he will ask stations to QSY to 50.110 and then continue the contact from his own gear and set the beacon running again.

"The P22s are finding their newly allocated 2 MHz from 50 to 52 MHz a great advantage, and making full use of it. On the 50.104 and 50.105 type stations on 146.70, 146.80 and 146.85 kHz are good beacons in JA." Thanks again, Graham, for your news and information. It makes good reading ... SLP.

SPORADIC E

John Aldrich VK8UL sends a page from "Wireless World" April 1978, headed "Mysteries of Sporadic E". As this is something which has no doubt intrigued most VHF operators for a long time, I feel it is worth printing for your interest, and I thank you, John, for your kindness in sending it along.

"Pat Hawker wrote in your February issue about the mystery of Sporadic E. Readers might like to know what has been learned, from a combination of ground-based and rocket observal on.

"Sporadic E was first seen to occur in the way it does, that is, as very thin intense layers of ionisation, by a British Skylark rocket flown from Woomera in 1955. By 1968 an association between the sporadic E layers and sharp reversals in wind direction at high altitude had become recognized. Wind measurements in the very rarified atmosphere up to 150 km or so revealed that a surprising pattern of wind reversals which can occur, what is more, the measurements showed that the pattern often develops slowly over a period of 'hours' with, for example, a sharp wind shear first appearing above 150 km height then moving downward to below 100 km before fading. The cause of this rather unexpected wind structure appears to be the propagation of atmospheric waves horizontally over great distances.

"The sharp wind shears are at the roots of the sporadic E layers, rather than a complete reversal of the winds, though they are at such heights, act to move the ions and electrons in the ionosphere across the Earth's magnetic field, but interactions then occur such as a way as to displace the plasma vertically. Where strong wind shears of the appropriate sense exist, the plasma is squeezed into a thin concentrated layer, being moved downwards from above, upwards from below. As the wind pattern descends the layer descends, too, into an even more dense atmosphere, until finally at a height of about 100 km it is brought to a halt.

"In a very productive experiment at Woomera in 1971 a Skylark rocket was launched with a ground-based radar which showed a strong layer overhead. Instruments on the rocket measured the exact position of the layer and something of a novelty, the ambient electric field as well; the wind structure was also charted in better than usual detail. A very strong wind shear was found, but the layer was not quite where theory required for the 'correct' wind. The correction to the question is asked why the explanation has been so long in coming — I should explain that physicists the world over have contributed to the solution — the answer is that the region concerned, roughly 100-200 km above the Earth's surface, is inaccessible to balloons and therefore to regular on-the-ground measurements.

"One final point. Were the sporadic E layers to be composed simply of ionised atmospheric

gases they wouldn't persist. They are, in fact, composed of ionised metallic atoms, mainly magnesium, silicon and iron, probably the remains of burned-up meteorites. The descending wind shears sweep up the metallic ions and bring them down to the Sporadic E layer just off the thermosphere into the lower regions where atmospheric turbulence then churns them away into oblivion. Sporadic E layers seem to be the product of Nature's vacuum cleaning! - E. B. Dorling, Mullard Space Science Laboratory, University College, London, Holmbury St. Mary, Surrey

So there you have it. I would think most of the above will be news to many, and may all in some of the gaps in your former thinking. HF NET FOR VKF OPS

During discussions recently with Robert VK3AUR in The Gramplains, moves were finally made to get the workings of an HF net off the ground for the purpose of the exchange of information between various VHF and UHF operators. At the time of writing it has been operating for two weeks on 3600 kHz, plus or minus QRX, with Robert VK3AUR as the co-ordinating station. The reason 3600 was chosen was to give Novice operators the chance to also join in if they desired. One of their ultimate goals could well be operation in VHF. The net commences at 1830 EST, and will continue for as long as required each Wednesday night until decided otherwise.

If your interests are largely orientated towards VHF/UHF, then you are invited to join in the discussions or listen as you choose. Maybe something will be gleaned from the conversation which will be of help or interest to you. Changes to operating times and procedures will no doubt be made from time to time, if you don't hear the net at 1830 EST maybe it is running later for the benefit of VK8 operators, so look around the frequency a bit later. Robert VK3AUR is bound to be there!

NEW RELEASE

I note from the pages of "Break In" that some consideration has been given in that country to a six metre band plan. However, it was decided that, as the band was a DX band and shared by many, it should not become a DX band. The band should remain a regular 6 metre operators' fall with likely increased band openings in the future there should be no restrictions on where one should operate. After discussion, two spot frequencies were decided upon, 52.525 for FM and 51.800 for AM simplex operation. Repeaters were to be discouraged.

Also from "Break In" comes news of a new 2 metre Internal Racer, built by ZL1AM and ZL4CA during last December. The distance was 993.3 km.

Steve K6MHP has written to ZL1BZZ seeking contacts over the 4400 mile path on 144 MHz in an attempt to beat the present 3,940 mile record. He runs 180 watts to a 18 dB gain antenna over a complete water path, so he could possibly have a chance if he can get anyone interested at the ZL end. The fact that nothing seems to happen across the Tasman between VK and ZL on 2 metres doesn't lend much comfort for an upsurge in interest either there or here in VK for a similar attempt. What about a Sydney to ZL contact on 2 metres for starters? Chaps! Why not a VK to ZL contact on 144? Both these paths should be possible on 144 at least at the right time of the year, and possibly rare occasions by other propagation means.

SENG CONVENTION

The South East Radio Group in Mt. Gambier held another very successful convention on the weekend of 3rd June with more than 100 amateurs registering. The winner of the SENG trophy for the second time was Peter VK3AWY, a well deserved win, as Peter really enjoys himself and enters most of the events. Once again the weather was kind and cleared of the earlier rain. The ladies are to be congratulated on their great evening meal on the Sunday. I am sure all who were present for the week-end will be looking forward to the 15th Convention next year.

During the Sunday evening at Mt. Gambier a discussion was initiated on the proposed extended use of Ch. 5A TV throughout Australia and in the Hamilton, Victoria, region in particular. Whilst the

words of the speakers did not actually fall on deaf ears, the subject did not arouse a lot of discussion at the time, but it is hoped amateurs will be thinking of the local implications of what this non-interactive channel will do to the 144 MHz band. It is well known that we amateurs are a confounded nuisance in the eyes of the various administrations and something they have tolerated to a degree so far, but I doubt if any tears would be shed at their level. We did not exist as an operating body - there would be more spectrum space available to be sold at a higher figure than we pay for it. Anyway, I am not going to prolong discussion on the subject at the moment, as I am in the course of preparing an article on the subject which I hope will be in AR next month for you to read.

Instead I will close with the thought for the month - a month which has slipped into a quieter form of activity as winter approaches and the VHF bands take up their usual quietness for the time of the year. "When Grandma was a girl she didn't do the things girls do today. But that grandma didn't do the things grandmas do today."

The Voice in the Hills.

AMATEUR SATELLITES

Cnas. Robinson VK3AGR

(VK3ZBS is temporarily overseas)

A letter has been received from Harry JA1AAG, our AMSAT Asian Pacific Net Co-ordinator. Harry has just returned from a three week trip to Europe and the United States. He wishes to thank all those who kept the net going during his absence.

When in the US he had the pleasure of having dinner with WPKF Terry Klein (Prax) of AMSAT and his family, and while in West Germany spoke to Karl DJAZC, who built the Mode A transponder for Oscar 7 and at the present time is building the hardware for Phase IIIA Satellite. Harry said they all send their very best 73 to all out here in this part of the world.

Included in Harry's newsletter were a number of interesting items such as the update on orbital elements (AMSAT Oscar 8), these are as follows: Period: P = 103.231836 - 1.117 x 10⁻⁴N. Increment: dI = 25.8079162 - 2.325 x 10⁻⁴N.

N = orbit number.

As of May 6th, 1978, the period was 103.230755 minutes, and the increment was 25.806915 degrees/orbit.

Do not worry, AO-8 is not falling down to the earth! And, for all practical purposes, we can use 103.23 minutes and 25.806 degrees/orbit.

Please note that Mondays are ORP days and Wednesdays are reserved for special experiments. AO-8 operates in Mode A on Mondays, Tuesdays, Thursdays and Fridays. Wednesdays will depend on the special experiments that happen to be conducted on that day, but usually will be left in Mode A. On Saturdays and Sundays AO-8 will be in Mode J.

It is interesting to note that Sporadic E and "Airm" F₂ layer have been interfering with down link signals from AO-8 recently. Especially on Mode A, both the 29.402 MHz telemetry beacon and all down-link signals within the 29.4 and 29.5 transponder passband suffer from weak to practically no signal, with severe flutter QSB due to sporadic E and F₂. However, do not give up! Under-mess "funny" conditions signals from AO-8 have been heard at very far away places. Although no two-ways have been recorded yet, signals from the satellite when flying over Siberia, for instance, have been heard in the East Coast of the USA!

Who knows, if we keep on trying, maybe a two-way QSO from Asia to the USA may happen. Again, please do not give up during these "funny" conditions!

A print-out of a number of queries concerning a transponder for Oscar 8 similar to that which was published in AR November 1974, which gives the ascending modes, the azimuth and elevation. As mentioned previously, any satellites put into the same orbit as AMSAT Oscar 6 and 7 would use this existing AR chart. A satellite placed in any

other circular orbit would require its own perpetual print-out. There are indications that all four of the Soviet RS Series satellites will have the same orbital characteristics (though considerably different from AMSAT Oscar 7), so a single perpetual print-out would serve all of them. Since Oscar 8 is in a different orbit than Oscar 7, it requires its own perpetual print-out. These, we hope, will be available in the near future. Unfortunately, other satellites in non-circular (i.e. highly elliptical) orbits do not lend themselves to this type of perpetual print-out. The reason for this is that the apogee and perigee passages around the earth and a pass with a given equator crossing longitude will not have the same azimuth and elevation angles as a pass with the same equator crossing longitude, four months later.

PHASE III FUNDING STATUS REPORT

John Shaw N4QO, via the AMSAT newsletter, states "Hardware costs for the Phase III project are expected to be in the neighbourhood of \$250,000 for two satellites. A complete Phase III satellite requires

2400 Solar Cells at \$10 each	\$24,000
12 Battery Cells at \$20 each	\$2,400
10 Kick Motors	\$10,000
20 Transmitters at \$5,000 each	\$10,000
2 Cosmic Computers at \$8,000 each	\$16,000
	\$62,400

A viable Phase III programme requires at least two complete satellite ready at any launch date, the unused back-up hardware available for a later launch.

We have passed the first milestone in our fundraising campaign. As of February 8, 1978, donations have been received for 2,837 solar cells and 36 battery cells. Thus, we have received donations for more than enough solar cells for the first Phase III satellite and three complete battery systems. According to the last regular tally, submitted by Larry P. Smith, W4WV, who handles printing and distribution of solar cell certificates, contributions have been received from all 50 States, all Canadian Provinces and over 42 foreign countries. A significant number of the contributors are non-amateurs, testifying to the universal appeal of the amateur satellite programme.

All contributors to the Phase III programme receive a numbered certificate, acknowledging the exact number of component sponsored. Contributors of \$1,000 or more will be honoured by having their name inscribed on a plaque to be placed on board the first Phase III satellite.

If you can make a donation to this worthwhile venture please make your cheque payable to AMSAT (in US funds) with accompanying note stating your sponsorship and address to AMSAT, PO Box 27, Washington, DC, 20044.

ORBIT PREDICTIONS - SEPTEMBER 1978

OSCAR 7				OSCAR 8			
Date	Time	Long	Lat	Date	Time	Long	Lat
1	173555	0102	81.9	1	2001A	0012	42
2	173608	0110	75.5	2	2151J	0018	44
3	17380A	0005	80.3	3	2259J	0023	45
4	17390A	0100	73.5	4	2354A	0028	46
5	17400A	0105	67.5	5	2557A	0033	48
6	17415A	0253	72.3	6	2571A	0039	49
7	17421B	0148	75.9	7	2585A	0044	50
8	174438	0047	70.8	8	2596A	0049	51
9	17455A	0141	84.4	9	2613J	0054	53
10	174605	0040	68.2	10	2677J	0100	57
11	174615	0135	82.8	11	2681A	0105	55
12	17463A	0034	87.7	12	2655A	0110	57
13	175005	0128	81.3	13	2686A	0115	58
14	175118	0028	86.1	14	2683A	0121	59
15	17531A	0122	79.7	15	2697A	0126	61
16	175439	0021	64.5	16	2711J	0131	62
17	175555	0116	78.1	17	2725A	0136	63
18	17560A	0015	63.0	18	2739A	0141	64
19	17581B	0109	78.5	19	2753A	0003	40
20	17593B	0009	61.4	20	2787A	0008	41
21	17596A	0103	75.0	21	2781A	0113	43
22	176108	0002	59.9	22	2785A	0118	44
23	17631B	0057	73.5	23	2799A	0123	45
24	17644A	0151	87.2	24	2833J	0029	46
25	17695B	0150	71.9	25	2837A	0034	48
26	17696B	0044	65.5	26	2851A	0039	49
27	17681A	0044	70.3	27	2855A	0044	50
28	17694B	0138	83.9	28	2879A	0050	52
29	17700B	0037	68.4	29	2883A	0055	53
30	17711A	0132	82.4	30	2905J	0100	54



YAESU from DICK SMITH

WHEN YOU REALLY CONSIDER THE ALTERNATIVES THERE ARE NONE!



Fabulous FRG-7 Communications Receiver

- 0.5 to 30MHz continuous reception
- Widely loop circuitry for stability
- Means of 12 volt operation portable.
- RFD for subband or CW reception
- 0.7uV sensitivity (for 10dB signal/noise)
- 2 IC's, 22 transistors and 16 diodes
- Comes with full instructions plus guide

EXCLUSIVE!

With every FRG-7 from Dick Smith or dealer, you receive this exclusive 8 page guide to short wave listening written by Arthur Cohen. A well known short wave world famous short wave correspondent and broadcaster



CAT D-2850

only
\$350

Terms available

See the review in MAY 1978 E.A.

★ NOW: A short wave antenna kit for the FRG-7 receiver (and any other shortwave receiver...)

★ Designed specifically for Dick by a short-wave expert, this antenna kit needs no soldering, is complete and ready to assemble and has full instructions. Get the most out of your receiver with a good antenna.

★ VALUE! Cat K 3490

\$950



EASY TERMS AVAILABLE TO APPROVED APPLICANTS

THE INCREDIBLE FT101E... WORLD'S TOP TOP SELLING HF TRANSCEIVER -

Why settle for less?

The complete 160M-10M HF amateur radio - just add antenna and either 240V or 12V (yes, it has an in-built DC converter!). Rated at 260W PEP and the in-built RF speech processor makes it sound even better. These units are so popular, we probably don't have to tell you about all their fabulous features - but call into D. S. store and we'll be happy to anyway!

Cat D 2890 \$895.00

WHY NOT BUILD YOUR WHOLE STATION AROUND THE FABULOUS FT-101E?

Impartial tests * prove the FT-101E receiver section is far superior to the TS-520S:

- Minimum detectable level FT-101E 8dB MORE SENSITIVE
- Intermodulation distortion FT-101E AdB BETTER
- Dynamic range FT-101E 12dB BETTER

[* QST May 1978 comparison]



Left! The QTR4 world clock. Work out at a glance when the sun is in the sky. Every 15 minutes it has one Cat K 1054 \$33.00

Right! YD 8444 desk set. 500 ohm 50k switch. 100 ohm 10k. 100 ohm 10k. Complete YDUR base station with a Yaesu microphone Cat C 1115 \$44.50



HOW'S THIS FOR THE ULTIMATE STATION?



FL-2100B HF LINEAR AMP \$540

Time proven reliable! The 2100B is world famous for its 50W 1.2kW of music - the ideal match for the FT-901D or the FT-101E. Best value linear amp available today! Cat D 2946

Easy terms available to all Yaesu transceivers approved applicants. Ask at your store!



Cat D-2854

FT-901D - ALL MODE ALL HF BAND TRANSCEIVER \$1275

Tomorrow's transceiver today! All mode operation - yes, even FM! This beautiful Yaesu has to be seen (and heard) to be believed! It's got features others just dream of! Basic unit \$1275. Add the optional memory unit Cat D-2858 @ \$149.50 and the DC-DC converter (Cat D-2856 @ \$75.00) and still pay less than \$1500.00. The acc plug features switchable 12V coupled to the band switch. Use our co-ax relay (Cat D-5210) to automatically switch antennas. WHY PAY MORE?



FTV-250 - 2M TRANSVERTER \$329

FULL 2M operation or when used with the FT-901D, 588 & CW for DX & OSCAR enthusiasts - FM for local work. Covers 144 to 149MHz - a 100 watt state. Also works the fabulous FT-101E. Why miss out on some of the hard won bands. Remember - use them or lose them! Cat D-2894

DICK SMITH for AMATEURS

Dick has an enormous range of amateur equipment, and it's growing daily! Call in today and have a look around. You're under no obligation! Dick Smith Electronics — the professional amateur suppliers.

New FULLY LEGAL ANTENNA ROTATOR



- Massive disc brake
- Fits up to 2" o.d. mast
- Rugged construction
- Completely waterproof
- Suitable for Wilson System

COMPLETE UNIT —
Rotator, control unit and
approved power supply:

\$148⁰⁰

Rotator & control box without
power supply Cat D-5000 \$122.00
Additional mast clamps (if
required) Cat D-5001

WE BELIEVE THIS IS THE ONLY
APPROVED ROTATOR IN ITS
CLASS IN AUSTRALIA!

BARGAIN ROTATOR CABLE 4 core cable for only 35c/metre. Sure, you'll need
w. lengths, but you get the advantages of an 8-core cable. Parallel wires to the
rotator to maintain voltage (no 0.05c/metre wires to control antenna (handy)
ys! 110v. 50. 0. to rotate rotator. Cat W-2000 35c/metre.

FOR MORSE CODERS:

Economy Key

Yes, that's the right price. Only \$1.80
for a bargain key that's ideal as a
first key. Excellent value for money.
Cat D-7105



\$1.80

Quality budget key

New design budget precision
key. Full quality
price of relative comparison.
Attractive price.
Cat D-7101



\$14⁷⁵

LEARN MORSE...

Here's value two
cassette recorded
with easy-to-learn
Morse. Starts off
simple, goes to full
Morse standard.
Completely aural
course — no printed
matter to grow you
down!

\$7.90



Cat D-7106

Hi-Mound deluxe

When you want a REAL Morse key here's the
Hi-Mound. It's probably one of the best hand
keys on the market, and at the budget price.
from Dick one of the best value keys around.



Cat D-7104

New! Wilson HF antennas

SYSTEM ONE BEAM

- 5 element
- 10dB gain
- 8m boom
- 8m longest element
- 5.6m turning radius

\$425

Cat D-4330

SYSTEM TWO BEAM

- 4 element
- 8.5dB gain
- 5.6m boom
- 8m longest element
- 5m turning radius

\$320

Cat D-4332

**BOTH ANTENNAS 50 OHMS IMPEDANCE, SWR LESS THAN 1.5:1
HUGE POWER RATING — KILOWATT PLUS ..
Maximum strength and minimum wind resistance**

Options: recommended toroids, balun for either system Cat D-4334 - \$19.95

INCREDIBLE BARGAINS!

MULTI Q-16 2m TRANSCEIVER

2 special priority positions to receiver
your favourite channels. Large 23 ch.
capacity • Provision for external VFO



NOW REDUCED TO
ONLY

169⁵⁰

Cat Q-3009

Some kits
available
for only
\$4.75 or
check at
a store!

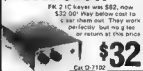
XXXX SPECIAL APOLLO LINEAR

was \$299³⁰ now \$199⁵⁰



* Full 2000W SSB *40-10M
* In-built RF pre-amp
* Only 30W drive
* RF attenuated — no messy control wheel
Originally \$229.50 Save \$100!
NOW REDUCED TO ONLY \$199.50
Don't miss out — Stock strictly limited

BELOW COST!



Cat D-7102

Morse trainer

Kit contains all parts to build
this precision oscillator. Battery
powered, ideal project!

\$5.90

BUILT UP VERSION
As pictured, but no key
Cat D-7110 \$7.90

KEYER KIT \$37⁵⁰

Complete kit inc. paddle. Case
is undrilled, plain
panels 50 x 75 x 1.5
March '78
Cat K-3470



PADDLE only
Cat D-7102

No-hands mobile

Safety and ease of
operation for all
mobility. Headset
inc/earpiece suits
most rigs — 800 ohm
imp. 8 ohm phone
Wires to part your
rig using extra.



Cat C-1120

\$27⁵⁰

Banish TV! FOREVER!

The ULTIMATE in low-pass
filters!

Precision built, 4 section filter. Massive
power! 100W — 5000W PEP or SSB.
Max. min attenuation is on TV channel
2 — 75dB. Insertion loss is less than 0.5
dB. Has 50-239 connectors, 52 ohms.

WHY TAKE
CHANCES? **\$37⁵⁰**

Cat D-7088

NEW! Tetra tower sections

Dick Smith really is the complete amateur store. Now you
can even buy your tower from us!

Introducing the Wilson Tetra Tower system.
You can buy one section at a time, or you can
buy a complete mast. Each section is 3.5 metres
long when assembled, yet is supplied in a
carton only 1 metre long. No need to hire a truck!

You can assemble as many 3.5m sections as you
like. 4 give you a 14m mast, (45'4") etc etc.
Accepts a 2" o.d. mast at top. Extremely strong
(wall support the system one at 68 ft suitably guyed)

It's the painless way to buy a world-class tower.

\$59⁵⁰

PER SECTION

Tower top
& rotor plate
option
Cat D-4338
\$29.50

DICK SMITH ELECTRONICS



AT LAST! THE YAESU FRG-7000



Yes! It's been a long time coming - but the wait was well and truly worth it!
The Yaesu FRG-7000 offers the serious SWL the ultimate in a communications receiver

- Digital frequency readout for accuracy (and allow absolute certainty in returning to a previously logged station)
- Full band coverage - from 0.25MHz (yes 0.25!) up to 29.8MHz - with provision for AM, SSB and CW reception
- Digital clock built-in displays local OR GMT (at the flick of a switch) plus allows the receiver to be turned on at any time (eg for recording when you're not there!)
- Wadley Loop circuitry for rock solid stability plus FET front end and sensitivity
- Operates from 100 to 240V AC 50/60Hz (easy modification allows portable 12V use)

\$695

Cat D-2848

Terms are available on other unit to personal shoppers - from a low 10% deposit and easy payments. Mail order customers. We'll send the unit or the FRG-7 to anywhere in Australia for \$5.00 by Comet.

Magnificent SCOOP PURCHASE

KENWOOD
TR-2200
2m portable



\$189⁰⁰

Cat D-3210

We've bought the entire Australian stock of the famous Kenwood TR 2200 2 metre portable. Never again available at this price! Two years ago it was selling for \$199.50 - today's price is even lower. Now is your chance to buy a versatile portable at a never-to-be-repeated price. **DON'T MISS OUT!**

KENWOOD
TR-7200
2m mobile

TOP VALUE

\$260

\$199⁰⁰

Cat D-3215

Fabulous 2 metre FM mobile transceiver features hi/lo power switch (1/10W) to save battery, reverse polarity protection, groupset for 22 channels, diode RF switching, etc etc etc. Hurry in for this special - they're reduced to clear. Only a few left and this price lasts only while stocks last!

EXCLUSIVE TO DICK!
FABULOUS NEW HEAVY DUTY
CO-AX RELAY

Save the high cost of an extra length of co-ax. Make instant antenna comparisons - instant hot zones to vertical change over. A truly professional relay for the serious amateur.

\$49⁵⁰

Cat D-5210



- waterproof
- latest micro-strip design
- 1.5 - 500MHz
- 2500W PEP to 80MHz
- 1500W PEP to 500MHz
- 9 - 18V control voltage
- 62 ohm impedance
- insertion loss less than 0.1dB
- insertion noise 100 fwht to measure

DON'T SETTLE FOR INFERIOR UNITS!

EASY TERMS AVAILABLE TO APPROVED APPLICANTS ON ALL ITEMS PRICED \$111 OR MORE.



FT-227R - FULL 2M RIG

\$375

As reviewed in the March issue of Electronics Australia. Full 2 metre, synthesised FM unit with memory. Ideal for repeaters and duplex operation. Best value rig available today!
Cat D-2890



YC-500S - 500MHz COUNTER

\$380

Fabulous professional quality - 500MHz counter. As reviewed in April E & A 240V or 12V operation. And it's even cheaper if you have a sales tax exemption!
Cat D-2892



FT-7 - NEW HF MOBILE RIG

\$539

Here it is! The new HF solid state 80 - 10 metre mobile transceiver. It's ideal for novice use, too. The best mobile unit going!
Cat D-2886



FL-110 - 200W LINEAR

\$210

Use the FT 7 or FT 301S as a 1st amplifier. One knob band switch ing no tuning required
Cat D-2884

DICK SMITH ELECTRONICS

SYDNEY

125 York Street, SYDNEY, Ph. 29-1126
147 Hume Hwy, CHULLORA, Ph. 642-8022
182 Pacific Hwy, GORE HILL, Ph. 430-6311
38 Grove Street, PARRAMATTA, Ph. 663-1133

MELBOURNE

BRISBANE
ADELAIDE

393 Lonsdale Street, MELBOURNE, Ph. 67-8834
665 Bridge Road, RICHMOND, Ph. 42-1814
106 Logan Road, SURFERS PARADE, Ph. 381-6233
263 Wright Street, ADELAIDE, Ph. 212-1862

welcome here

SHOPS OPEN 10AM to 6:30PM
(Saturday 10AM - 12 noon)
BRISBANE 1/2 hour earlier

• ALL TERMS OFFERED ARE TO APPROVED APPLICANTS ONLY

Many items available from the 900 South Melbourne Centre at

GRACE BROS

Wholesale & Retail - 2 locations - Melbourne & Sydney - 1000s of products - 1000s of products - 1000s of products



MAIL ORDERS P.O. Box 747, Crows Nest, N.S.W. 2065. Post and packing extra.

Dealers across Australia.

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

Dear OM,
The Editor,
Dear Sir

A month ago, I reactivated my second QTH call sign DL3FMA. I use a TEN-TEC "Century/21" at about 80 watts input power and a 3-element rotary Yagi.

Results obtained so far have been so promising that I would like to have schedules with stations Down Under.

I have worked a lot of Australian stations thus showing that the long path can successfully be used by my relatively low power rig.

I think that there is a special Australian amateur radio magazine. May I ask you to put into this monthly that I am anxious to get in contact with any Australian radio amateur who, like me, would be interested in a schedule. He may drop a line to the following address:

Prof Dr Karl G. Lickfeld, DL3FMA
Inst f. Med Mikrobiologie
Hufelandstr. 55
D-4300 Essen 1
FR Germany (FRG)

I thank you in advance for your kind help. Letting you know that I very much enjoyed a stay in Australia in 1974, am sincerely yours, Karl Lickfeld

The Editor,
Dear Sir,

Leaving Australia is after a most pleasant holiday, we, the XYL and myself, wish to say that we agree 100 per cent with Art Lickfield who says, "It's back Down Under 'Nothing In Australia is king-of-the-hill everything is a giant-size!"

So has been the hospitality we found everywhere in your wonderful and interesting country.

Claude and Ann PAC and, 73, A10

C. Valchek, VK3BLZ/PALAO, 8 Annis Court, Sale, 3560.

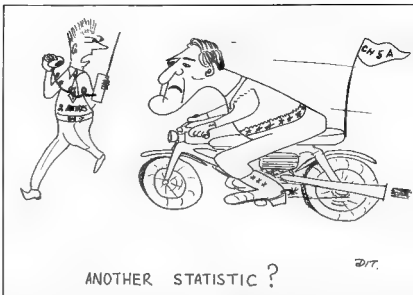
The Editor,
Dear Sir,

I would like to make a plea to all Amateurs and prospective Amateurs to carefully read through the correspondence from Steve Gregory VK3OT and Robert Winkles VK3AUR in June 1978 "Amateur Radio" relating to the new channel 5A TV allocations, particularly in Western Victoria. If these two Amateurs are the only ones who are going to protest at the rape of yet another Amateur band, then all I can say is that we thoroughly deserve to lose the 2m band.

The spotty shown by the vast majority of Amateurs, both within the WA and outside it, is incredible.

At the time I was first licensed in the early 1950s there was an attitude which prevailed among many Amateurs that we should never rock the boat, treat the P & T (then P.M.G.A.) Dept as a holy law above reproach, ask for favours in a cap in hand fashion and all would be well with the world. Unfortunately, I feel that with many people this attitude still exists even today but it's totally unrealistic.

On a number of recent occasions the extent to which the P & T Dept. care for Amateurs' interests has been clearly demonstrated. When reporting in case of very blatant pirate operation on 10m by a Melbourne stat on claiming one day to be a 2L4 and on another day to be a VK1 (same name, equipment, voice beam heading), I was told by a P & T official, "Frankly, we just aren't interested." When the local monitoring and frequency measuring stat on was advised and given details of frequency, beam heading and call sign being used, I was asked "What kHz is that?" and after a few minutes' apparent search for the signal I was told there was no trace of any 10m signals at the station. This



despite the fact that at the time there were dozens of 5B plus signals on the band! The fact that we accept being lobbied off in this manner is our fault and does our cause harm by not pursuing the matter.

Recently, when Eric Jamieson VK3LP tried to stir up interest in making an approach to regain the Six Mcire band, the number of people who even bothered to show support was pathetic. Congratulations to those who did bother to write with your ideas and encouragement, but what about the rest of you? I feel sure had Eric's campaign brought the band back immediately there would have been a multitude of operators active — after someone else had done the spadework!

For many years now we have had it drummed into us that the spectre of WARC '79 looms over us but those who have made the greatest noise about it have given little if any lead to the individual member as to how he or she can do their bit to help. I feel the WIA has fallen down in its duty (perhaps unknowingly and with the best of intentions) in getting the message across. Those closest to the problem may suffer from a lack of ability to communicate adequately to the general membership. The obvious measures we can all take are to: 1) If not already a member of the WIA, join and add YOUR support to the only organization that can represent your interests. If you don't agree with WIA policy, fair enough, at least be part of the WIA and show how it might be improved, from within instead of from the sidelines. Use the bands that are available to you (whether a Full, Limited or Novice license) as often as possible and ensure you play your part in maintaining activity. When you do operate, do so in a manner befitting a member of the Amateur Service, show that you know how to operate properly, this will make the CBers and HFers in our bands a lot easier to spot.

To return to the matter of channel 5A, we now have the prospect that in many areas there will be no operation possible on either the 6m or 2m Amateur bands. To those of you unfamiliar with such a situation, ask any 6m operator from Brisbane, Melbourne or Wagga how funny it has been trying to operate OR EVEN LISTEN on 6m since 1954.

I would like to ask one very important question. Why is it that in Australia those in charge of frequency planning are unable to produce anything other than an utter shambles?

In the USA, which has roughly the same area as Australia, but with a population of well over 200 million plus many millions more in surrounding areas such as Canada, Mexico, Central America and the Caribbean, they enjoy the most generous Amateur frequency allocations anywhere. Here we have the ludicrous situation of Australian stations on 80m and 40m being limited to 3,500-7,000 MHz and 7,000-150 MHz while stations as close as New

Zealand operate as strongly as any locals in the full allocation on both bands. In the USA full VHF and UHF Amateur allocations co-exist with TV services with little if any trouble. Here we have the 6m band reduced to half (32-64 MHz) and virtually unusable in two major metropolitan areas because of TVI. On 2m the same sad story has been repeated in both Wollongong and Newcastle with worse to come.

The letter from the Prime Minister to Steve VK3OT states (in part) "The Minister advised that, bearing in mind the number of services that will be provided in the area and the lack of available frequencies, it is considered that there is no suitable alternative available". We all know of the problems with frequencies for TV but what effort has been put into working out a proper solution? Why aren't the UHF frequencies available being utilized? Are these being held back until after WARC '79? If so why are other countries heavily involved in UHF TV?

Serely UHF would be an ideal answer to the 5A problem. Every day the number of old monochrome TV receivers grows less and all new TV receivers either have UHF tuners or provision for them. Certainly VHF may give better coverage from one station but this is a what channel 0 thought: in 1963, but really, do they want to have viewers in Alaska and -upset? The initial cost of UHF and the number of channels available could easily solve the 5A problem. Sooner or later we must go UHF so why not now?

To say there are no suitable frequencies available is too stupid for comment. How do the cities of the eastern USA seaboard fare with the enormous number of transmitters in use there?

Before it is too late we must all do SOMETHING to try and save our VHF bands, if we lose 2m, there will be NO VHF Amateur bands for many, even most, Australian Amateurs, contemplate this situation! As things stand at the moment there seems little if any likelihood that this situation will not come about.

Yours faithfully, Geoff Wilson VK3AMK.

5 Cahill Street
Strathmore 4600,
29th June, 1978

The Editor,
Dear Sir,

You published two articles for me in the December 1977 edition of AR. At the end of the articles I mentioned that I would supply PCBs for the units. I have supplied boards in dubs and drafts for the last six months and would now like to put an end to it. Could you please publish a more appropriate place in your magazine that the Christmas tree lights boards are \$5.00, plus postage (40c), and the Two Tone Oscillator boards are

\$4.00 including postage. No more boards or enquiries will be supplied after the end of September this year.

Yours faithfully,

N. Cooper VK4ZNC.

175 Bridge Street,
Bendigo, Vic. 3552.
29th June, 1978.

The Editor,
Dear Sir,

I have just received my first copy of *Amateur Radio* which I read with great interest and enjoyment until I read a letter by Stephen Gregory VK3GT referring to the "DX and You" column.

I was very disappointed with the vicious criticism displayed in the letter and felt it rather unnecessary. I must point out that the writer of that column is prepared to contribute more for *Amateur Radio* in a practical way than simply to sit back and write over-critical letters of someone else's efforts.

I trust that the attitude of apparent total intolerance is not a general one among amateurs otherwise all the effort I have put into working for an amateur licence has been a complete waste of time.

Yours faithfully,

D. G. Laity

1 Hillside Crescent,
Epping, NSW 2121.
June 23rd, 1978.

The Editor,
Dear Sir,

Granted the fact that there are a lot of Novices (and lots more to come), could we have more articles in AR that are down to our level?

I'm sure that the Full Call members wouldn't mind a bit all the Full Call folk I've met are falling over themselves to help the half-baked types like myself.

A couple of cases in point. On page 21 of June AR I find a paragraph on how to make a DVM adapter. Now I have no doubt that many Novices, and probably all Full Call members, will know what "DVM" means. But I just don't, and I suspect that quite a few Novices don't know either. Why not use a little more ink and spell the whole three words out?

Further on page 15 of the same issue there is a "Two tube phasing rig" which I would like to make up. But I simply don't know enough to even attempt this project on the amateur data supplied. I know that some reading this letter will nearly have died laughing by now... maybe those who are laughing may have forgotten that they were once half-baked, too. Mayday. Mayday. I'm sinking in a sea of superior technology and unnecessary abbreviations. Such is the difference would be a big help to others like me.

Yours faithfully

Norman Blake VK2NDQ.

[Editor's note: Our "Novice Notes" column will be a regular feature (every 2/3 months at the moment). We would appreciate some Novice-oriented articles from readers in this regard. Incidentally, a DVM is a "Digital Volt Meter".]

6 John Street,
Cootamundra, NSW 2590.
24-6-1978.

The Editor,
Dear Sir,

Hamradio is a marvellous service to all amateurs, yet it is possible to get caught.

Last year I advertised a piece of equipment and received a few replies. The main interested buyer was \$100 cash short of the agreed price. As I believed all amateurs to be honourable gentlemen (he is a full call), I sent the set to help him out, and received his bank cheque.

The verbal agreement was that he would pay the balance when he could. After a month, I wrote a friendly reminder, but received no reply. Several more letters and a couple of attempted phone calls (he was not in) followed, during about five months, to no avail. Finally, I had my solicitor draft a letter to him. His solicitor replied on his behalf, denying a balance existed.

Therefore I lost \$100 and he gained a cheap set with a full complement of spare tubes. Possibly this happens often, so I have written this letter in the hope that it may prevent someone else getting caught.

The next time I sell an item I will have cash in hand before despatching it!

Sincerely yours,

Geoff Barron VK4ZAT

13 Salisbury Avenue,
Bensley 2207
26-6-1978.

The Editor,
Dear Sir,

A few lines about the National Field Day, which I think is both enjoyable and a very valuable technical exercise, because it forces one to prepare the gear available and to make it work under emergency conditions.

For about 25 years I have entered the FFD using low power and on CW only. The number of CW stations is low, worse luck, but I think the section should be maintained while it is viable.

Here I have a confession to make, in that I wandered off and went SSB on relatively high power this year (1978).

Receiving the results in a recent AR seems to show that the CW sections were supported even less than usual.

Therefore, I intend to go back to CW in 1979 and I wonder if you could publicise the need to maintain a CW activity in Amateur Radio and the reasons for doing so, particularly the good effect obtained on low power.

This presumes that you agree with me.

I feel that going SSB after so long on CW in FFD was like deserting an old friend!

Yours faithfully,

J. A. Mead VK3JM.

WARC 79 - NEXT YEAR

20/6/78.

The Editor,
Dear Sir,

I refer to page 46 of AR June 1978, wherein is reference to "Why should ITU standard make the standard for examinations when you're rarely likely to hear it on air anyway?"

Apart from the fact that the second half of the quoted statement is nonsense and far from the truth, I think that the question concerned is one which the Editor of "Radio 23" (SARL magazine) answered in his Editorial in February 1978. His statement applies just as much to would-be Australian radio amateur operators as it does to South African counterparts, and I ask, sir, that you kindly give space to printing it, as follows.—

Editorial

CW TELEGRAPHY QUO VADIS?

One of the less satisfactory sequels to the advance of technology, so far as the radio amateur is concerned, is the approaching demise of manual telegraphy as a mode of direct communications.

It is clearly defined in plans made to the maritime service and elsewhere that CWD telegraphy shall be superseded by teleprinter and data communications. With the passing of Morse will go the ship's "Spark". The aeronautical operator has already succumbed.

Some 2R licensees may feel irked that they will have to pass an examination, albeit at 12 w/min. in an almost outmoded code, which will not be in use whilst they are still young and active hams. However, radio amateurs are members of an exclusive society, and part of the exclusivity is proficiency in telegraphy. It may be that the authorities share in this point of view, and in an

effort to keep the numbers of amateurs within economical bounds, have used the examinations in regulations, theory and the Morse code as a means to this. Should we complain? Of course not — we had to come up the hard way — if others wish to join us let them join us as peers.

It is incumbent on those who have received the accolade of the ZS call, to encourage our 2R members to advance to full participation in amateur radio. To this end ZSIHQ is sending the Headquarters Bulletin on 7500 kHz on Sundays from 0745H to 0815H, and Branches are exhorted to supplement Technical Colleges and private tutors' lessons by on-the-air Morse tuition.

It is necessary that the ZS Licence be seen as a challenge and a hurdle to be surmounted, but the means to overcome the obstacles must be provided for the enthusiast. *73 de Peter ZSIU.*

It is my honest opinion that, unlike what is being peddled around today, CW telegraphy will continue to provide countless contacts, with a wonderful means of two-way communication, especially in amateur radio circles, just as it has done for millions of men, women, boys and girls, 5 years to 95 years during the past century, the world over.

Eric Trebilcock L30042
Thornbury 3071.

Technical Articles Always Needed

3 Maxwell Street
Lalor, Vic. 3075.
VK3VW.

The Editor,
Dear Sir,

On the 5th of June I was unlucky enough to be involved in a five car pile-up on the Mume Highway, south of Wangaratta.

After clearing the road I called on two metres and established contact with Bruce VK3ZSR in Wangaratta. Bruce then contacted my son in Melbourne on the 800 ohm line, passed relevant details and arranged for him to come and pick us up.

This quick and efficient action was not only a relief to me but more so to my XYL who was suffering from shock.

Through the pages of *Amateur Radio* I would like to offer my sincere thanks to Bruce, whose action can best be described as operating the true spirit of amateur radio.

Mike O'Sullivan VK3VW,
Asst. Secretary WIA Vic Division.

The Editor,
Dear Sir,

Morse Examination Standard.

I believe that I am only one of a large number of amateurs who was quite disillusioned and disappointed by the quality of the 10 w.p.m. Morse tests offered by the May Section L telegraphy examination.

Apart from a rather weird audio tone the speed of the transmission appeared to be quite variable and character and word spacing somewhat inconsistent.

After 8 errors at the previous examination I felt confident of success, but would not be surprised if I amassed 30 to 40 errors!

Surely the matter should be taken up with P and T so that examination presents more of a suitable quality to give everyone a reasonable chance of achieving their aim — the full licence.

Maurie Hooper VK3ZMA/NMH

Join a new Member — NOW —

AWARDS COLUMN

Brian Austin, VK5CA

P.O. Box 7A Crafers SA, 5152

BUDPEST AWARD

The Budapest Award was founded in 1963. This was a long time ago, and the rapidly increasing number of the Budapest radio amateurs made it necessary for the Radio Amateur League of Budapest to establish certain modifications concerning the rules of the Award. The new rules we present here comply with the following requirement: a Ham or SVL certificate should be given only when you make a great performance in amateur radio communications.

- In order to have a possibility of acquiring our Budapest Award contact (or listen to) different HA5 or HQ5 stations as follows:
E. stations — 75 different HA5 stations.
DX stations — 25 different HA5 stations.
VHF stations — 50 different HQ5 stations, or 5000 kms summarised distance.
- Contacts are valid from 1-1-1989. The same station may be represented only once in your application.
- Any amateur bands and modes may be used. Active (land or air) VHF/UHF repeaters may be used as well VHF/UHF contacts by satellite or via the Moon count with 500 kms/GSO value.
- After 1-1-1976 the certificate is issued in one class and may be received only once. So there are no endorsements either.
- The Radio Amateur League of Budapest is entitled to issue a unique special class of Budapest Award to acknowledge some particularly remarkable amateur radio achievements.
- Apply with certified list of your contacts (listenings) and send it with 10 RCA to the Award Manager of BRAL, Dabó Terecsy HASMA, H-1653 Budapest P.O. Box 2 Hungary.
- Please note: There are two activity week-ends of Budapest radio amateurs, one for HF bands during the second full week-end of May, and one for 2m band a week after that.

THE CQ TV AWARD

To mark the 100th issue of CQ TV, SATC is introducing an operating award scheme whose aim is to encourage activity in amateur television by providing an incentive in the form of a certificate.

This award is available to both transmitting and receiving amateurs and SWLs in any part of the world, whether they are members of the British Amateur Television Club or not.

The award is for contacts made using fast scan high definition television systems only.

Consideration has been given to the advantages achieved by stations in high activity areas or with exceptional geographical locations, therefore qualification for the award is on a points basis as detailed below.

TRANSMITTING AWARD

For pictures transmitted which have been successfully identified by another station claim two points per kilometre. If the contact becomes a successful two-way exchange of pictures then 10 bonus points may be claimed by each station regardless of distance.

Careful logging of transmissions is essential.

RECEIVING AWARD

For any picture positively identified claim 2 points per kilometre.

Points are claimed as above, however if the contact is 23 cm or above, the points should be doubled.

The award is divided into three grades — for the Bronze, 1000 points, for the Silver, 5000 points; and for the Gold, 10,000 points.

CONTACTS

A station may be worked once only per day for the purpose of this award. It is quite possible for the award to be gained by working the same station many times, but the aim is to promote activity of any sort. Points may only be claimed for contacts made from 1-11-1977.

THE CERTIFICATE

Upon qualification for the Bronze award a certificate will be issued together with the Bronze seal, the certificate may be upgraded later with Silver or Gold seals. No charge will be made for the award, but please send return postage with each application.

APPLICATIONS

Applications should include log details consisting of call sign, date of QSO, band, location of the station worked and points claimed. Contacts made from other than the home station should be clearly marked. QSL cards are not required, but the application should be checked and signed by one other licensed amateur. Send to Award Manager, John Wood G3YQC, 54 Elkington Road, Yelvertoft, Northampton NN6 7LU.

SENDER'S AWARD

The Ballarat Amateur Radio Group, Victoria, Australia, has initiated the "Bespoke Award" Certificate which is available to Amateur Operators or SWLs who can show confirmation of working or hearing Ballarat Amateurs.

As from January 1 1978, the requirements for issue of the certificate are:

- DX STATIONS OR SWLs:**
Work or hear 5 Ballarat Amateur Stations. Any Band, Any Mode. Cost 6 IRCs.
- VE STATIONS OR SWLs:**
Work or hear 10 Ballarat Amateur Stations. Any Band, Any Mode. Cost \$2.00.
- LOGS:**
Send a list of Stations worked stating Call Sign Name, Date, Band, Mode and Time in Zulu Do not send QSL Cards.
- SEND LIST TO:**
Award Manager, R. E. Barker, 22 Paula Crescent, Wandouree, Victoria, Australia, 3355.
From Brain Stars VK3ZBS, Publicity Officer. ■

MAGAZINE INDEX

Syd Clark, VK3ASC

OBT February 1978

The Micro-TO Message Keyer; A Long-Delayed Echo Revisited; More Reflections on LDEs; The Long-Boom Quag; DC-Band Energy — A Rejection Filter; A Spectacle Modulated Code Blinker; A Universal Crystal Oscillator; Calculating Capacitor Values; Tracking the Next OSCAR; Blackout Spawns Amateur/Police Liaison Network; RPT Assistance List; La Scala of Milan Cured; some Virginia Hams; The Lure of 2 Metres; The Honour Roll; Not for the Faint Hearted; Results, 1977 IARU Radiosport Championship; Frequency Measuring Test; Contest Disqualification Criteria; and Club Competition Rules; Ham Activity and Solar Activity Going Up; FCC Drops 220 Restrictions; Public Relations, German Style.

QST April 1978

A 20-Metre High Performance Direct-Conversion Receiver, The State-Variable Filter; Frequency Memory for Receivers with Digital Readout; Go ATV with this Transceiver; Mycorder; Short Ground-Radiat Systems for Short Verticals; Collecting a Ham's Tools of the Trade; The Lure of 2 Metres; His Computer Does the Operating; Two Sides of the Public Service Story; Straight Key Night; Results, Eighth Annual ARRL 160 Metre Contest; Setup Equipment and WARG; George, the TV is Acting Up Again; Not Just Bigger — But Better Than Ever; Secondary and Special-Event Licences Abolished; African Amateur Radio Common Roots.

ARRL International News May 1978

A 144 MHz FM Black Box; The AMSAT-OSCAR D Spacecraft; The Satellite Band Plan; The Robot Model 400 SSTV Converter; Technical Topics.

RADIO 75 January 1978

The Z880 Minihack Special, Getting the Most out of Your Yaesu FT75-B, The AMSAT-OSCAR D Spacecraft; VHF Meteor Scatter Propagation.

QST March 1978

How Visual Displays Work; A FET Volt-ohmmeter with Linear Ohms Readout, New Tasks for the Digital Voltmeter, Locating Geo-synchronous Satellites, A Permissible Tuned Variable-Frequency Oscillator, The Flapjacks Deluxe (Antenna), Microwave Mobile Propagation; Microwaves, Mozzarella Burgers and Mountains, The Lure of Two Metres, From Russia with Love, PR Group — NYC Marathon, Dr. Gler An Uncommon Man, Quiet Proposals, 1977 Can-Am Contest Results, Rules, ARRL International EME Competition; April QD Party — All ARRL Members. ■

IARU NEWS

The Federal President, David Wardlaw VK3ADW and the Immediate Past President, Michael Owen VK3KI, visited New Zealand over the Queen's Birthday week-end at the invitation of NZART.

They attended meetings of the NZART Council as well as the annual Conference of the Society. The visit was reported as being extremely useful and a free ranging exchange of views occurred especially in relation to preparations for WARC 79. ■

QSP

DID YOU KNOW?

That NASA has launched the world's most powerful communications satellite? Jointly developed by the USA and Canada, the Communications Technology Satellite boasts 200 watts of power to transmit written messages, television pictures, and voice communications. 'Marist' satellites were positioned over the Atlantic, Pacific and Indian Oceans to facilitate maritime communications.

That Ham signals above 30 metres frequently reach the moon at enough strength to be clearly readable? If a receiver up there using a decant antenna was tuned to the frequency, most moderately powered transmitters that use dipoles, which radiate appreciable power straight up, reach the moon when it is high in the sky, providing the ionospheric critical frequency is low enough to permit the signals to punch through at high radiation angles.

"Ham Radio", December 1977. ■

HAMADS

- Eight lines free to all WIA members.
- \$9 per 3 typescript per non-member.
- Copy in typescript please, with black letters to P.O. Box 150, Toorak, Vic. 3142.
- Reprints may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Correspondence received after about 12th of the month cannot be processed.
- QTH means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

EVENTS

CAPRICORNIA AMATEUR RADIO FESTIVAL, conducted by WIA Central Queensland Branch, will be held in Rockhampton, 16-17 September. Interests for everyone. For details write Secretary, Box 498, Rockhampton 4700.

FOR SALE

Kenwood TR7406A, 800 ch. 30W FM Txcr., ex. cond., in original carton, instr. bk., mic and mobile bracket, incl. serv. manual (worth \$250), \$350, VK3ZGW, GTHR Ph. (087) 25 2407.

Type Recorder, Phillips 54 in. real/real and m.c., as new, \$50, Ocker Box SWR 20 SWR and power meter recalibrated to give accurate power readings to 145 MHz, \$50, AWA MRS15 6m FM car phone with preamp, as new, must be sold to licensee holder only, \$60, ONO, 430 MHz ATU converter from Microclin, brand new, \$25, incl. post; Pys Mk. IIA Txcr., \$3,866 AM, \$30, Pys Mk. IIA Txcr., \$2,100 DSB, \$20, Slove VK2ZSC Ph. (02) 674 2104, after 5.30 p.m. EST.

110 Volt Drains 20 Rx with handbook, has SSB, CW, AM and VHF facilities, requires 240/110V transformer and speaker, \$140, ONO, Heathkit reflected power and SWR bridge meter, \$15. Both in A1 condition. VK2QLZ, QTHR Ph. (02) 76 6861

Uniden 2020 and remote VFO, immaculate, \$750; IC 202 with crystals covering 144 to 144.6 MHz, Oscar, \$170, Heath monitor scope, \$100, Stollie rotor, control box and cable, \$70, 8Y/2m Jay beam, \$35, VK3AZM, QTHR Ph. (052) 52 1824

Barlow Wadley Rx, good condition, no FM, \$150 VK3AXA, QTHR Ph. (050) 42 7248

Uniden 2020 Transceiver, complete with m.c., test book and service manual, all as new, \$550. Heathkit SB800 speaker, \$10, Mini Products 2015/10/16 metre vire antenna, 9 ft overall, \$25; Powerband 2m solid state power amp, \$5, waits out, \$35. VK3OM, QTHR Ph. (03) 560 9215

Kyokuto Tens Encoder/Decoder, SC-12A 12-channel Select units, suit any rig, cost \$120 ea., sell \$75 ea. 12 on hand. Mark Webster VK2BAK, QTHR Ph. (05) 48 6241

Icom IC202SS, SSB, 8 months old, mint condition, in original packaging with standard accessories, \$170. Ian Coups vs VK5IK, QTHR Ph. Edunda (SA) 252

Uniden 2040 HF PLL Transceiver, set VFO, matching speaker, manual, \$700. Yaseu, FL2000B linear amplifier 1200W SSB, 572B triodes, \$400, Yaseu Y0100 monitorscope, \$225; Glegg 27B FM 2m transceiver, 146-147 MHz, synthesised mobile mount, \$125; Teleprinters, mod 15 page printer, mod. 14 typing reporter, series models, both overhauled, \$50 ea. VK2BCA, QTHR Ph. (048) 81 1880

Yaseu FT75B HF Transceiver with 9 sifs, AC and DC power supplies, external VFO, VC 75 external VOX unit and speech processor and mobile mounting bracket, \$500; FT200 with all 10m crystals, plus 11m, 3375; Ken KP202 2m FM RX, 2R, 40, 80 with blades and charger, \$180 Jim Hendrickson. Ph. (03) 728 0060

Freq. meter, 0-30 MHz, \$150; counter, 0-30 MHz, HP 524 DR, \$110; alg. gen. 10-300 MHz, \$140; HP 5150 100 kHz, \$80; C-1 T5, Abn/CW, 50W 2-18 MHz, xtal cal. etc. \$30; C-42 Tcvt, 38-80 MHz, \$30, Scorpion transceiver, 2m, 2m, 100W, \$120 Doug Johnson VK3YMG, Shepparton. Ph. (058) 21 2308

FR-101 Rx, all bands to 2m, excellent condition, \$700 ONO B. G. Roche, 103 Sig Bn., Laverack Bk., Milpo, Townsville, Qld., 4813

Power Transceiver, 320V, 50 Hz primary to 115V secondary at 2000W, in good condition, \$120, also power transformer, 240V 50Hz primary to 110V secondary at 1000W, in excellent condition, \$85. Both transformers in steel boxes with 240V leads and 3-pin plugs and have a number of American 2-pin socket outlets built in. VK4XT, QTHR Ph. (074) 42 3288

Coaxial Remote Control Switch for 2 antennas, \$10; audio filter for CW P-220, \$20, frequency marker, 5-500 kHz and 5-100 kHz, \$20 ea., auto-tuned solid state compressor, \$50, line filter, 100V 5 amp, \$5, ampex tubes, 2 6L6s, \$5 ea., ampex tubes, 2 6E6s/8737, \$30 ea.; Toyomura 2m Rx amplifier, 18-140 dB; 320; Vanguard RF pre-amp 28 MHz Rx only \$20 VK1BH, QTHR Ph. (062) 65 5385 Bus., (022) 56 0082 A.H.

Ch. 40 xials for AWA MR Series, 4055.5 and 10285 kHz, never used, complete with AWA, \$10. VK2BAZ, QTHR Ph. (02) 72 1107

Communications Rx, realistic DX180, as new cond., perfect order, with instruction manual, \$120 Keith Long VK2NH and VK2BYL, 1 Moe's Pde., Chatswood Ph. (02) 428 5354

Yaseu FT801DM, the ultimate status symbol transceiver, new and complete with m.c., AC and DC plugs, etc., English language instruction manual (not photocopy), will demonstrate "on air" this QTH and air deliver any capital city, \$1,400. VK3SB, QTHR Ph. (03) 550 3521

Teletype Machines, type 15, excellent cond., with h'books, \$55 and \$75, SSB, AM, CW transceiver, 3-band, 80 and 40m coils fitted with provision for 3rd band, suit novice, 25-30W PEP, with VFO, \$165 VK2ZH3, QTHR Ph. (02) 58 5290

Solid State Forest-Phone, suitable for 160 or 80m, \$40 McLeod Transceivers, \$30 ea. 144 MHz - AC Rx, converted, \$50. Each has 2nd crystal, 7 ch. VK3NCF, Ph. (055) 82 2182 or (055) 62 7140

SBTV Monitor, kit includes 11 in. tube, W6LMD circuit completed, EHT supply, 450V CT and 53V AC, A and R 6672 transformer and 2 off A, and R 2155A transformers, plus 2 off 40 mF 450V, 2 off 2500 mF 63V, 1 off 1000 mF 63V electrolytics, \$150, ONO; Quad, 2 element spider commercial unit, bus spreaders, etc., \$125, VK4AAAT, QTHR. Ph. (07) 208 7868

Collins KW82 and power supply, \$1600, Kenwood 600, \$550, Yaseu FT301, \$550, All in perfect condition. VK7AZ, Ph. (022) 44 1185

TV measuring CRO, Marconi TF1277 C/W markers, deflec. single or differential I/P, in-line monitor facility both channels. Sync section requires some work, \$775 firm or swap for TP995A/S generator or similar or Kyokuto FM mobile. Also Marconi TF142E distortion meter, \$70, and Telex frequency meter \$5 to 1000 Hz (incl. mains PSU) and charts, any other, cash adjustment on swaps if needed. Ian Foster VK3BLF, Ph. (051) 56 8311 anytime

Immaculate FT101 MM II inc. manual, factory packing, but mod only, magnificent condition \$540 ONO Heathkit SB800 monitor scope kit, complete, only \$300 inc. m.c. TR2200G FM carry portable, nicad and AC powered, 7 repeaters and 3 simplex ch fitted - value \$220. IC22A, ch. 2, 4, 6, 8 repeaters and anti repeaters, 3, 5, 7 repeaters and simplex channels (see IC22B at IC22A price) \$240 FT75B including AC and DC PSUs, FV50C ext VFO, 3 ch all bands, immaculate condition and performance, \$550 FDX401 & FV401 ext VFO & "Magnetron Six" RF speech processor, combination for 2m, 70cm, 23cm, excellent condition, all manuals, \$700 (will not separate) VK3ATR, QTHR Ph. (03) 338 1054 AH

Complete station, deceased estate. Collins KWM-2 unmarked with PM2 power supply, instruction book and homemade amplifier to suit, all in proper working order, \$1850. Also 100W lower, approx. 40 ft. with 3-4m 20m and 2-4m 15m yagi and 2m antennas. HAM-Rotor control unit and cable antenna to be dismantled. Kew Vic. VK3AHR, QTHR Ph. (03) 508 4203.

8m Transmitter, almost comp., uses 3/12 in final, 200 2m 135s and sockets, \$20 Trans dip switch, HS, not cal., 15 to 200m Novice band scale, \$15. Assembled MC meters - all Heavy current/high voltage power supply, suit linear amp., \$80 Doug Maggetts VK3NGO, 29 Bolinda Rd., Nth. Balwyn, Vic. Ph. (03) 857 8475

R2553 Communications Rx, 28.1 MHz bands, 1 kHz dial calibration, 15 to 30.5 MHz, manuals, phones, excellent condition, \$250 ONO. Also available - spare modules, Collins mech. filter, 500 kHz BW 3.1 kHz for above Allan VK2GR, QTHR Ph. (02) 47 4344

Kenwood UHF Transceiver, 700A all-mode unit, 12 months old, in excellent order, \$485. Kenwood 7200G mobile xtal, reptra 2 to 8, simplex 40, 46, 50, 51, 52, \$185. Swan 500 HF Tcvt, excellent order, only \$295. VK3OM, QTHR Ph. (053) 49 2028

1 Crystal Lattice Filter, XF-38B, made by Yaseu for AM, gives 4 kHz band-width, ideal for FR101 and FT101, with instructions, \$35, VK3AT, QTHR

Collins KWM 2 888 Tcvt, with Collins AC power supply, Collins speaker, Collins cassette case to suit above, new Shure 404C mike, as new condition, had very little use, \$1,605.90 James VK2JO Ph. (02) 36 7756

Q886 Gen. Cov. Rx, exc. cond., with handbook \$180, ONO, B. Bathols VK3UV, QTHR Ph. (03) 90 6424 A.H.

WANTED

DV21 or DV21A in good condition (matching synthesised VFO for Icom IC21A), VK3ABZ, QTHR Ph. (03) 232 9482

Webster "Band-Spacer" or similar antenna, suitable for portable work. Also roller inductance (ceramic), approx. 30 turns 2 in. diameter, for aerial tuning unit. VK2APK, QTHR Ph. (063) 86 2709

FT-280 Transceiver with AC power supply Details to VK3OM, QTHR Ph. (03) 560 9215

Transceiver or Transmitter to suit Novice, in working order and reasonable condition, up to \$100, Contact Warren Ross. Ph. (03) 570 8729

Transformer, 240V primary, 350V sec., 1:15 volts, at 40 mA or more. VK3ZRO, QTHR Ph. (03) 82 2634

SILENT KEYS

It is with deep regret that we record the passing of -

Mr. G. K. PARKER L20916
Mr. J. C. GUTCHER VK3APU
Mr. D. E. BURGESS VK3YAX
Mr. G. N. MARKS VK3AK

FV401, also matching transmitter to FRDX400 for collection of 400 series equipment. Ian Foster VK3BLF Ph. (051) 56 8311 anytime
Circuit of ex-Army AS10 Radio Set wanted. Also want sockets for 2P1 CRO tube. VK4NB, QTHR Ph. (07) 59 1945

WANTED KNOWN

Requires the date - Trial Notice exam - Saturday, 15th September, 2 p.m. Club Instructions & pass note Details WIA (NSW) Education Officer, Box 109, Toombago, 2146.

STOLEN EQUIPMENT: FROM CAR

Icom IC-22S, Serial No. 8209943 with Scolar mag base and 1/4 whip. Ribbon cable attached to diode board, other and unidentified Pioneer KP-4200 Serial No. 05859 car/cassette. A no model aircraft accessories and other items. Any information to VK3ZLL, 2 Ruddock Avenue, Hilton, S.A. 5033 Ph. (08) 83 9496

TRADE HAMADE

QPS Electronic Imports, for Yaseu, Kenwood, Standard, Emotator Rotators, Multiband Verticals, Quds, Yagis and Mobile Antennas, plus many accessories. All practices checked with a 90 day warranty. Low prices that you should be able to afford. Call Greg Whittier after seven years' experience handling Ham equipment he knows your requirements Ph. (03) 873 2930.

8-180 Microprocessor Kits from \$100 - We supply by return mail or road transport a wide range of 8-180 microprocessor kits and bare boards from stock. Kits for 8080A and 280 CPU, memory, I/O, motherboards, power transformers, card cages etc. Good prices on chips, programs & services for 2708 EPROMs, software development and assembly. Write for details a note to The Micro Shop, Box 207, Gawler, SA 5116. Mail orders only

ADVERTISERS' INDEX

AMATEUR ELECTRONIC IMPORTS	44, 45
AMATEURS PARADISE	25
AUSTRALIAN SOUND AND SIGNAL	18
BAL ELECTRONICS	36, 38
BRIGHT STAR CRYSTALS	28
CHURNSIDE ELECTRONICS	20, 21
CUSTOM COMMUNICATIONS	37
DELTA COMMUNICATIONS SERVICES	28
DICK SMITH ELECTRONICS	52, 53, 54
ELMEASCO INSTRUMENTS PTY LTD	60
EMONA ELECTRONICS	30, 31
G F S ELECTRONIC IMPORTS	46
GRAHAM STALLARD	14, 26
HAM RADIO SUPPLIES	2
PIZZO ELECTRIC PRODUCTS	5
SCALAR INDUSTRIES	5
SIDEBAND ELECTRONICS IMPORTS	22
SIDEBAND ELECTRONICS SALES	14, 36
SPECTRUM INTERNATIONAL	28
TRIO-KENWOOD	59
VICOM	13
WILLIAM WILLIS & CO.	45
WERNER ELECTRONICS	37



KENWOOD AMATEUR COMMUNICATIONS

WHENEVER YOU WANT TO MOVE UP — KENWOOD HAS THE WAY



TS-820 SERIES

FEATURES

- The AT 200 is an antenna tuner designed for use with the TS-520S and TS-820 series a though it is compatible with most of today's HF transceivers.
- The AT 200 consists of an antenna coupler, a through line RF wattmeter, an SWR meter and an antenna switch.
- The AT 200 is designed to be used on the amateur bands between 1.8 MHz and 29.7 MHz.
- The RF wattmeter has two ranges, 20W and 200W.
- The antenna switch has four outputs. Two of these are for coaxial feed antennas, one is for a wire antenna and one is for connecting a dummy load.
- The AT 200 is also capable of matching your transceiver with a wire antenna such as an inverted L. This makes it possible to enjoy communication on the lower frequency bands.



SPECIFICATIONS

Frequency Range	160 meter band— 1.8 to 2.0 MHz
	80 meter band— 3.5 to 4.0 MHz
	40 meter band— 7.0 to 7.3 MHz
	20 meter band— 14.0 to 14.35 MHz
	15 meter band— 21.0 to 21.45 MHz
	10 meter band— 28.0 to 29.7 MHz
	SSB CW RTTY
Drive Power	80 Watts or more for full output
RF Input Power	SSB 2 000 Watts PEP
	CW RTTY 1 000 Watts DC

The new KENWOOD TS 700S is the all mode solid state transceiver that provides you with versatility plus over the entire 2 meter band. Its feature packed design puts you on SSB, FM, CW, and AM. The AC and DC power supplies are built in which allows you to operate the TS 700S just about anywhere. Equipped with a VFO that enables continuous tuning from 144—148MHz, the TS 700S comes complete with built in digital frequency readout, receiver preamplifier, VOX, sidetone, and microphone.



“TRIO-KENWOOD (AUSTRALIA) PTY. LTD.”

30 Whiting Street, Artarmon, Sydney N.S.W. Australia 2064

Telephone (02) 439 4322

DRAKE TR-7

continuous coverage

Introducing a remarkable engineering breakthrough



Models shown
are Drake
TR-7/DR-7
with RV-7
and MS-7

DR-7
continuous coverage reception capability

The Drake TR-7 System significantly advances the technology of worldwide radio communications and unfolds an entirely new state of the art.

Amateur Band transmission, including capability for MARS, Embassy, Government, and future band expansions*

Call, phone or write for a detailed brochure NOW

ELMEASCO

Instruments Pty. Ltd.

P.O. Box 30 Concord N.S.W. 2137
Telephone 736-2886
Melbourne P.O. Box 107, Mt Waverley Vic 314
Telephone 233-4044
Adelaide 42-6666, Brisbane 392 2884
Perth 25-3144

THE

AUGUST 1978.

Patron: His Excellency the Governor,
Air Chief Marshall,
Sir Wallace Kyle. G.C.B., C.B.E., D.S.O., D.F.C., K. of St. John.

President: Mr. L. A. Ball VK6AN.
Secretary: Mr. P. Savage VK6NCP.
Treasurer: Mr. A. van den Avoort VK6CU.

接 署 林 署 署 署 署 署

Please address all correspondence to:-

The Hon. Secretary,
W.I.A. (W.A. DIVISION).
Box N1002,
G.P.O. Perth,
W.A. 6001.

* * *

As this screed is being typed, the news of local amateurs is not good. Reports to hand would indicate that Hugh VK6FS was stricken with appendicitis but should soon be back operating on his favourite 20 metre band.

Len VK6WN has also been hospitalised and we wish him a speedy recovery.

Ron VK6KW, recently suffered a heart attack and it is hoped that by the time this reaches you he will be well on the road to health.

All the best to the three of you and to any one else who my spies may have missed.

The grapevine has also yielded the information that VK6JG, Ted has returned to the sunny ? west. Welcome back O.M.

WK6CIG, A spot of news from a passing sea-gull, to the effect that Irwin Gerbers, is sheltering in his vessel at the Two Rocks Marina - - Welcome to the West and safe sailing.

[illegible]

How often would this happen ?

Les VK6EB and XYL Poppy VK6NEB working DX on 15 metres, were fortunate enough to make contact with another husband and wife team, JK1DWP and his XYL JK1DWQ.

黃 黃 黃 黃 黃 黃 黃 黃 黃 黃 黃 黃 黃

THE SECOND WEST AUSTRALIAN ANNUAL VHF/UHF TRANSMITTING CONTEST.RULES

1. DURATION:- SATURDAY September 30th, 1978 and Sunday 1st Oct, 1978 on both days between the hours of 1930 and 2200 W.A. Time. Five operating hours in all.
2. FREQUENCIES:- All contacts to be made on the 52/144/432/1296 Mhz bands using any of the following modes:-
CW, S.S.B., AM, FM, RTTY, TV.
3. CALLING:- Stations will call CQ WAA using the three times rule technique. Infringement of this rule by the use of long CQ calls may entail disqualification, as will the pre-arranging of QSO's. Cross band or made QSO's or mobile contacts not permitted.
4. POINTS:- Points for contacts are as follows with the exception that stations using the following modes will get the additional multiplier shown.

(a)	C.W.	will get a multiplier of	- 3	Mode Multiplier
(b)	SSB	" " " "	- 2	
(c)	AM	" " " "	- 4	
(d)	FM	" " " "	- 1.5	
(e)	RTTY	" " " "	- 3	
(f)	TV	" " " "	- 3	

5. POINTS PER CONTACT:- 52/144/432 Mhz :- For the transmitting stations up to 250 ft above sea level and to a 20 Km radius. -5

For stations 250ft to 1000ft A.S.L. and to a 40 Km radius -3

For each kilometre over the radius - - - 1

Also applies for repeater use.

1296 Mhz For each kilometre from Tx - - 5

Above scoring applies to all W.A. Shires.

An additional multiplier shall be applied for the inner and outer country shire areas as follows:-

Metro to Metro shires	a Multiplier of	- - - - 1	
" " Inner Country Shires	a Multiplier of	- 2	
" " Outer	" " " "	- 8	
Inner to Inner	" " " "	- 3	Additional Multiplier
" " Metro	" " " "	- 4	
Inner to Outer	" " " "	- 10	
Outer to Outer	" " " "	- 6	
Outer to Metro	" " " "	- 10	
Outer to Inner	" " " "	- 10	

6. SCORING:- Stations may be worked twice on each night i.e. once between 1930 and 2115 and again from 2115 to 2200 and these contacts will count for points. Each time contacts will take the form of an exchange of RST followed by Shire letters and last two numbers of your postcode e.g. station in Bassendean would send 599BA54 or if in Armadale 599AK12.

7. LOGS:- Contest logs to be neatly set out on one side of quarto or foolscap sheet ruled as shown below:-

Date= Your Shire = Scoring = POINTS x Total
Your Code = Multipliers + kilom. = Total Pts.

TIME	FREQ	MODE	CALL	TKD	RST OUT	RST IN	SHIRE	CODE	POINTS	DIST	MODE	ADD	TL
											MLT	MLT	PTS
19.30	144	FM	VK6XYZ	59	59	CA	55	5			1.5		7.5
19.40	144	RTTY	VK6ZYK	56	56	BO	44	5	200		3	2	225
19.50	144	R.FM	VK6YZX	59	59	BY	30	5			1.5	1.5	115

Rules contd:-

Last column to be totalled at the foot of each page and the running totals brought forward.

The last page should contain the following summary:-

Total number of contacts and total number of points scored - input power and comments on equipment and aeriels used - and approximate height above sea level, with comments on the contest in general.

Logs to be addressed to the WAA CONTEST COMMITTEE, PO Box 6250, Hay Street East, PERTH, W.A. 6000 and posted so as to reach us not later than 20th. OCT. The results will be published in the December issue of the W.A. Bulletin.

* * * * *

CW - IMPENDING DEMISE ?

From Region % News

by Tom CLARKSON ZL2AZ.

Every now and again we see some reference to a decrease in morse and CW in amateur activity and an inference is drawn that the use of CW will fade out, and perhaps the sooner the better, to make more room for telephony. Some critics of CW feel they have dealt it a tolling blow by putting it in a category together with "smoke signals". I would like to put forward the view that CW is part of the amateur scene that should be encouraged. We all have the urge to seek self expression via amateur radio, and the exact form this expression takes varies tremendously - there are a dozen or more widely differing fields of endeavour, quite highly specialised, that do not overlap among themselves but are nevertheless properly grouped within this voluntary "service of radio communication" and go to form its corporate strength. It ill behoves any of us to deprecate an activity cherished by sections of our fraternity. I believe it is an error to try and evaluate CW in terms of telephony or vice versa, and that unless this error is recognised and avoided serious misunderstandings may develop.

If CW is destined to fade out I would like to pose the question, why has it not done so before now? Radio Telegraphy is only about ten years older than radio telephony - so why has it remained alive - to the extent that today the CW bands in popular parts of the spectrum are full to overflowing? While there is no doubt that the traditional telegraph has been largely displaced in the exchange of the world's information, the demands there have been different from those met and experienced in the amateur service. Here the durability of CW may well be due in part to hidden or unrecognised characteristics. The solid virtues of morse and CW as a means of transporting the written word through a variable medium are well known and have contributed to the ability for them to prevail. But might there be some other influence at work, not so evident but powerful enough to keep the merry cadence of CW going strongly perhaps indefinitely.

The derisive term of "smoke signals" could even have an element of glorification in it. As a boy in Napier I was amused by seeing there a notice on a sign painter's shop "I made signs before I could talk". Years later I

I came to recognise a powerful element in this simple observation, by appreciating the presence of significant influences when any mode of communication is involved. But such influences are only evaluated when the means of communication are studied fundamentally - when the means is considered as acting as an extension of the mind, the same way as the roof may be considered to be an extension of the scalp or the wheel may be considered as an extension of the foot. The status of amateur CW is likely to be enhanced by a scrutiny of the fundamentals it is involved with.

It is easy to trace the decline of the telegraph from its palmy days of eminence in the official and commercial world and when the telegram was a common thing in the home. Telegraphy was associated with a phase in civiliz-

ation which accompanied the dominance of writing, printing, the book, the news paper, the trial balance, the telegram, and which is now being superceded by the visual and aural, electronic services of the telephone, broadcasting, the computer, and TV, which are in the process of moulding our age.

But where is the counterpart in the use of CW in our amateur activities? Here there is a different situation. Most CW contacts consist of the exchange of thoughts. Expressions such as "how is copy" may be used but are not actually written. Even notes "on the cuff" will be very meagre. This process is enhanced in effect by the art of the skilled amateur operator in his subconscious use of abbreviations and the jargon that has developed (though this jargon is never actually uttered or written). The code itself has evolved into a remarkably efficient one, despite its age, even when compared with other recent codes. It is of course rather different from the Samuel Morse original.

There is another unique factor involved in the use of morse in the amateur service. While public telegraphy had highly developed high speed and printing systems, using morse those were for sending and receiving written messages; but for exchanging thoughts between individuals there was nothing then available approaching the advanced types of keying devices now commonly used by amateurs. The amateur using CW today is not so much a telegraphist as an exchanger of thoughts by means of signals. So we are dealing with a system very closely knit with mental processes. The "personal interest" aspect of the defined amateur service seems to apply to it a very direct manner.

Even if the importance of the printed word declines or becomes unimportant in many world affairs, as has been predicted, there should still be a place for a system that enables meaningful signals between minds of individuals to be exchanged instantly, without recourse to speech or language, even at great distances, and with no intermediate facilities or control. Whether recognised or not I suggest that it is in this area that amateur CW has a secret weapon that will ensure its survival and prosperity.

So in our amateur service, which embraces so many different activities CW morse should be recognised as a worthy participant and all plans should provide for its welfare and growth. Established amateurs who concentrate on telephony and other modes should respect the claims for CW, and newcomers to our ranks should be encouraged to become really skilled in it - to discover its special character - to find out why so many are drawn to work on the CW bands.

* * * * *

Some food for thought there isn't there ? Any comments ? ?

* * * * *

Recently to hand is the following list of awards offered by the Far East Auxiliary Radio League (FEARL).

Worked 15 KA Stations. A station must have established contact with 15 KA stations, regardless of length of QSO.

KA Ragchewers Award. A station must have conducted a continuous QSO with any KA station for a minimum of 30 minutes.

KA Ragchewers Supreme Award. A station must have conducted a continuous QSO with any KA station for a minimum of 60 minutes.

KA Roundtable Award. A station must have conducted a continuous QSO with 2 or more KA stations for a minimum of 30 minutes. The QSO's must be at the same time and on the same frequency.

Note: A good place to meet KA stations is the KA net, which meets every Sunday at 0200 Z on 14.285 MHz.

Our congratulations to Neil VK6FI who recently received the KA rag-chewer's Award.
FEARL Awards Manager, c/- San Fleming, ASAGARH-ID-GS-M,
APO San Francisco, California. 96343.